

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 12,0 f1  
 Edition : 29.03.89  
 Replaces : 31.7.87  
 Test oil : ISO-4113

Combination no. : 0 402 046 758

Injection pump  
 Pump designation : PES6P120A320RS3139  
 EP type number : 0 412 026 718  
 Governor  
 Governor design. : RQV275...950PA728-1  
 Governor no. : 0 421 813 465

## Customer-spec. information

Customer : RVI

Engine : MIDR 063540

1st version kW : 243.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 23.7...23.9

100 s: (23.4...24.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.50...5.70

Del.quantity cm<sup>3</sup>/ : 2.3...2.9

100 s: (2.0...3.2)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
 travel mm : 1.30...1.70

2nd speed rpm : 450  
 travel mm : 3.30...3.70

3rd speed rpm : 800  
 travel mm : 5.60...6.00

4th speed rpm : 950  
 travel mm : 6.70...6.90

### GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 237.0...239.0

1000 : (234.0...242.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 59...67

### Testing:

1st rack travel in: 11.50  
Speed rpm : 1020...1030  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 8...16

### Testing:

Speed rpm : 200  
Minimum rack trave: 7.30  
Speed rpm : 275  
Rack travel in mm : 5.50...5.70

## CONSTANT REGULATION

Speed rpm : 300...400

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.50...12.60

### Measurement

Speed 1/min : 500

### 1st pressure hPa : -

Rack travel in m: 9.40...9.50

### 2nd pressure hPa : 520

Rack travel in m: 11.70...11.80

### 3rd pressure hPa : 200

Rack travel in m: 9.80...10.50

## START CUT-OUT

Speed 1/min : 195 (215)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000  
Speed rpm : 950  
Del.quantity cm3/ : 227.0...233.0  
1000 s: (224.0...236.0)

## Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 120.0...122.0  
1000 s: (117.0...125.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 1020...1030

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (136.0...164.0)

## LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 23.0...29.0  
1000 s: (20.0...32.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

### Remarks:

:  
Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,4 l12  
 Edition : 14.04.89  
 Replaces : 12.85  
 Test oil : ISO-4113

Combination no. : 0 402 046 762

Injection pump  
 Pump designation : PES6P120A820LS3077-  
 10  
 EP type number : 0 412 026 714  
 Governor  
 Governor design. : RQ300/1100PA761  
 Governor no. : 0 421 801 302

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM407A

1st version kW : 177.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.50...10.60

Del.quantity cm<sup>3</sup>/ : 15.2...15.4

100 s: (14.9...15.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.0...5.2

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 650

Rack travel in mm : 13.00...14.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 152.0...154.0

1000 : (149.0...157.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 13.5

Testing:

1st rack travel in: 9.50  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.1

Testing:

Speed rpm : 100  
Minimum rack trave: 6.70  
Speed rpm : 300  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 2.00  
Speed rpm : 360...400

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ 1000 s: 152.0...158.0  
1000 s: (149.0...161.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 150.0...170.0  
1000 s: (146.0...174.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 a 4

Edition : 14.04.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 046 764

## Injection pump

Pump designation : PES6P110A820LS3131

EP type number : 0 412 016 715

## Governor

Governor design. : RQ300/1100PA779

Governor no. : 0 421 801 325

## Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM427h

1st version kW : 177.0

Rated speed : 2200

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

### Overflow

quantity min. 1/h: 100...120

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 015

### Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
(4.25...4.45)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 14.0...14.2

100 s: (13.7...14.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 300.0

Rack travel in mm : 7.1...7.3

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 140.0...142.0

1000 : (137.0...145.0)

Spread cm<sup>3</sup> : 4.00

1000 : (8.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.20

Speed rpm : 1140...1150

2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.2

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.80  
Speed rpm : 300  
Rack travel in mm : 7.10...7.30  
Rack travel in mm : 2.00  
Speed rpm : 360...400

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ 1000 s: 117.0...121.0  
1000 s: (114.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:  
:

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 a 9  
 Edition : 14.04.89  
 Replaces : 2.12.86  
 Test oil : ISO-4113

Combination no. : 0 402 046 773

Injection pump  
 Pump designation : PES6P110A820LS3131  
 EP type number : 0 412 016 715  
 Governor  
 Governor design. : RQ300/1100PA800  
 Governor no. : 0 421 801 347

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM427H

1st version kW : 177.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
 (4.25...4.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 13.9...14.1

100 s: (13.6...14.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 300.0

Rack travel in mm : 7.2...7.4

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 13.00...14.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 139.0...141.0

1000 : (136.5...143.5)

Spread cm<sup>3</sup> : 4.00

1000 : (8.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 13.5

Testing:

1st rack travel in: 10.00

Speed rpm : 1140...1150

2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.3

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.80  
Speed rpm : 300  
Rack travel in mm : 7.20...7.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 116.0...119.0  
1000 s: (113.0...122.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:  
:

Adjust full-load delivery by turning  
temperature-dependent excess-fuel stop  
for starting (TAS).

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 a10  
 Edition : 07.04.89  
 Replaces : 31.10.86  
 Test oil : ISO-4113

Combination no. : 0 402 046 775

Injection pump  
 Pump designation : PES6P110A820LS3131  
 EP type number : 0 412 016 715  
 Governor  
 Governor design. : RG300/1100PA786-1  
 Governor no. : 0 421 801 353

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM427H

1st version kW : 177.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
 : (4.25...4.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 13.9...14.1

100 s: (13.6...14.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 300.0

Rack travel in mm : 7.2...7.4

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 13.00...14.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 139.0...141.0

1000 : (136.5...143.5)

Spread cm<sup>3</sup> : 4.00

1000 : (8.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 13.5

Testing:

1st rack travel in: 10.00

Speed rpm : 1140...1150

2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.3

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.80  
Speed rpm : 300  
Rack travel in mm : 7.20...7.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 116.0...119.0  
1000 s: (113.0...122.0)  
Spread cm<sup>3</sup> : -  
1000 s: (9.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:  
:

Adjust full-load delivery by turning  
temperature-dependent excess-fuel stop  
for starting (TAS).

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 9,8 f 1  
 Edition : 14.04.89

Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 046 789

## Injection pump

Pump designation : PES6P120A320RS3139  
 EP type number : 0 412 026 718  
 Governor  
 Governor design. : RQV275...1000PA728-3  
 Governer no. : 0 421 813 657

## Customer-spec. information

Customer : RVI

Engine : MIDR 062045 H

1st version kW : 227.0

Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 19.1...19.3

100 s: (18.8...19.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 1.8...2.4

100 s: (1.5...2.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.90...1.10

2nd speed rpm : 450

travel mm : 3.30...3.70

3rd speed rpm : 800

travel mm : 5.60...6.00

4th speed rpm : 1000

travel mm : 7.00...7.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1170

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 191.0...193.0

1000 : (188.0...196.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 59...67

### Testing:

1st rack travel in: 10.00  
Speed rpm : 1065...1075  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever

position degrees: 8...16

### Testing:

Speed rpm : 200  
Minimum rack trave: 7.10  
Speed rpm : 275  
Rack travel in mm : 5.30...5.50

## CONSTANT REGULATION

Speed rpm : 310...415

## Aneroid/Altitude Compensator Test

### 1st version

Setting

Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.00...11.10

## Measurement

Speed 1/min : 500

### 1st pressure hPa : -

Rack travel in m: 8.60...8.80

### 2nd pressure hPa : 280

Rack travel in m: 10.30...10.40

### 3rd pressure hPa : 160

Rack travel in m: 9.30...9.50

## START CUT-OUT

Speed 1/min : 195 (215)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 187.0...193.0  
1000 s: (184.0...196.0)

## Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 98.0...100.0  
1000 s: (95.0...103.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 1065...1075

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (136.0...164.0)

## LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 18.0...24.0  
1000 s: (15.0...27.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

## Remarks:

:  
Start-of-delivery mark 9.5° cam angle  
after start of delivery cyl. 1



## RATED SPEED

1st version

Control lever

position degrees: 58...66

### Testing:

1st rack travel in: 12.30  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever

position degrees: 8...16

### Testing:

Speed rpm : 200  
Minimum rack trave: 7.60  
Speed rpm : 275  
Rack travel in mm : 5.80...6.00

## CONSTANT REGULATION

Speed rpm : 295...400

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.30...13.40

## Measurement

Speed 1/min : 500

### 1st pressure hPa : -

Rack travel in m: 9.50...9.70

### 2nd pressure hPa : 660

Rack travel in m: 12.60...12.70

### 3rd pressure hPa : 200

Rack travel in m: 10.30...10.50

## START CUT-OUT

Speed 1/min : 195 (215)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000  
Speed rpm : 950  
Del.quantity cm3/ : 245.0...251.0  
1000 s: (242.0...254.0)

## Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 120.0...122.0  
1000 s: (117.0...125.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 12.30  
Speed rpm : 1015...1025

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (136.0...164.0)

## LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.60...5.80  
Del.quantity cm3/ : 23.0...29.0  
1000 s: (20.0...32.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

## Remarks:

:  
Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 a11  
 Edition : 07.04.89  
 Replaces : 7.1.88  
 Test oil : ISO-4113

Combination no. : 0 402 046 793

Injection pump  
 Pump designation : PES6P110A820LS3131  
 EP type number : 0 412 016 715  
 Governor  
 Governor design. : RQ300/1100PA800-1  
 Governor no. : 0 421 801 426

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM447h

1st version kW : 150.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
 (4.25...4.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 9.90...10.00

Del.quantity cm<sup>3</sup>/

100 s: (10.6...11.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 300.0

Rack travel in mm : 7.1...7.3

Del.quantity cm<sup>3</sup>/

100 s: (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 13.00...14.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 109.0...111.0

1000 : (106.5...113.5)

Spread cm<sup>3</sup> : 4.00

1000 : (8.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 13.5

Testing:

1st rack travel in: 8.90

Speed rpm : 1140...1150

2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.2

Testing:  
Speed rpm : 200  
Minimum rack trave: 9.50  
Speed rpm : 300  
Rack travel in mm : 7.10...7.30  
Rack travel in mm : 2.00  
Speed rpm : 360...400

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 80.0...84.0  
1000 s: (77.0...87.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.90  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:  
:

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 12,2 c  
 Edition : 31.03.89  
 Replaces : 7.2.89  
 Test oil : ISO-4113

Combination no. : 0 402 046 797

Injection pump  
 Pump designation : PES6P120A320RS3212  
 EP type number : 0 412 026 731  
 Governor  
 Governor design. : RQV250..1050PA794-2  
 Governer no. : 0 421 813 698

## Customer-spec. information

Customer : PERKINS

Engine : EAGLE TX

1st version kW : 240.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.60...14.70

Del.quantity cm3/ : 23.9...24.1

100 s: (23.6...24.4)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : ?

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...2.0)

Spread cm3 : 0.3

100 s: (0.6)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.90...1.30  
 2nd speed rpm : 350  
 travel mm : 2.90...3.50  
 3rd speed rpm : 700  
 travel mm : 4.00...4.60  
 4th speed rpm : 1000  
 travel mm : 7.40...7.60  
 5th speed rpm : 1100  
 travel mm : 8.80...9.20

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1070

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 239.0...241.0  
1000 : (236.0...244.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 243.0...249.0  
1000 s: (240.0...252.0)

#### RATED SPEED

1st version  
Control lever  
position degrees: 50...58

Testing:  
1st rack travel in: 13.60  
Speed rpm : 980...990  
2nd rack travel in: 4.00  
Speed rpm : 1085...1115  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 16...24

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 250...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.60...14.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.20...12.30  
2nd pressure hPa : 900  
Rack travel in m: 14.10...14.20  
3rd pressure hPa : 510  
Rack travel in m: 12.60...12.80

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version

BREAKAWAY  
1st version  
1mm rack travel less than

full load rack tr: 13.60  
Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...170.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10

Remarks:

:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm  
Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11/8 r  
 Edition : 31.03.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 804

Injection pump  
 Pump designation : PES6P110A820LS3222  
 EP type number : 0 412 016 725  
 Governor  
 Governor design. : RQ350/1100PA655-1  
 Governer no. : 0 421 801 475

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM447h

1st version kW : 132.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm	: 4.30...4.40
	: (4.25...4.45)
Rack travel in mm	: 9.00...12.00
Firing order	: 6- 2- 4- 1- 5- 3
Phasing	: 0-60-120-180-240-300
Tolerance + - °	: 0.50 (0.75)
Time to cyl. no.	: 6
	<b>BASIC SETTING</b>
1st speed rpm	: 1050
Rack travel in mm	: 8.80...8.90
Del.quantity cm <sup>3</sup> /	: 10.3...10.5
	100 s: (10.0...10.7)
Spread cm <sup>3</sup>	: 0.4
	100 s: (0.8)
2nd speed rpm	: 350.0
Rack travel in mm	: 7.0...7.3
Del.quantity cm <sup>3</sup> /	: 1.4...2.0
	100 s: (1.1...2.2)
Spread cm <sup>3</sup>	: 0.4
	100 s: (0.8)
	<b>GUIDE SLEEVE POSITION</b>
Control-lever position	
	Degree: -1
Speed rpm	: 600
Rack travel in mm	: 13.00...14.00
	<b>FULL LOAD DELIV. AT FULL LOAD STOP</b>
1st version	
Speed rpm	: 1050
Del.quantity	: 103.0...105.0
	1000 : (100.5...107.5)
Spread cm <sup>3</sup>	: 4.00
	1000 : (8.00)
	<b>RATED SPEED</b>
1st version	
Setting point:	
Speed rpm	: 600
Rack travel in mm	: 13.5
	<b>Testing:</b>
1st rack travel in:	7.80
Speed rpm	: 1095...1110

2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.1

Testing:  
Speed rpm : 200  
Minimum rack trave: 9.50  
Speed rpm : 350  
Rack travel in mm : 7.00...7.30  
Rack travel in mm : 2.00  
Speed rpm : 400...440

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 8.80...8.90  
2nd speed rpm : 800  
Rack travel in m: 8.90...9.10  
3rd speed rpm : 600  
Rack travel in m: 9.10...9.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 94.0...98.0  
1000 s: (91.0...101.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)

#### RACK STOP ADJUSTMENT

Speed rpm : 600

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 7.80  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 9,6 u 3  
 Edition : 14.04.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 805  
 Injection pump  
 Pump designation : PES6P110A720RS3104  
 EP type number : 0 412 016 712  
 Governor  
 Governor design. : RQV300...1075PA850-3  
 Governer no. : 0 421 813 743  
 Customer-spec. information  
 Customer : KHD  
 Engine : BF6L413FRC/513RC  
 1st version kW : 198.0  
 Rated speed : 2150

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values

**BEGINNING OF DELIVERY**

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1075  
 Rack travel in mm : 14.00...14.10  
 Del.quantity cm<sup>3</sup>/ : 16.4...16.6  
 100 s: (16.1...16.9)

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 7.9...8.1  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.4)

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.00...1.40  
 2nd speed rpm : 450  
 travel mm : 2.60...3.20  
 3rd speed rpm : 650  
 travel mm : 4.70...5.30  
 4th speed rpm : 1110  
 travel mm : 8.20...8.40  
 5th speed rpm : 1250  
 travel mm : 9.50...9.90

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1140  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1075  
 Aneroid pressure h: 900  
 Del.quantity : 164.0...166.0  
 1000 : (161.0...169.0)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

## RATED SPEED

### 1st version

Control lever

position degrees: 52...60

### Testing:

1st rack travel in: 13.00  
Speed rpm : 1105...1115  
2nd rack travel in: 4.00  
Speed rpm : 1235...1265  
4th rack travel in: 14.00  
Speed rpm : 0.00...1.00

## LOW IDLE 1

### Control lever

position degrees: 19...27

### Testing:

Speed rpm : 100  
Minimum rack trave: 9.40  
Speed rpm : 300  
Rack travel in mm : 7.90...8.10

## CONSTANT REGULATION

Speed rpm : 300...520

## TORQUE CONTROL

Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 1075  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 700  
Rack travel in m: 14.20...14.40  
3rd speed rpm : 850  
Rack travel in m: 14.10...14.30

## Aneroid/Altitude Compensator Test

### 1st version

#### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.20...14.30

#### Measurement

Speed 1/min : 500

### 1st pressure hPa : -

Rack travel in m: 12.40...12.60  
2nd pressure hPa : 510  
Rack travel in m: 13.70...13.80  
3rd pressure hPa : 375  
Rack travel in m: 12.70...12.90

## START CUT-OUT

Speed 1/min : 250 (270)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ 1000 s: 170.0...174.0  
1000 s: (168.0...176.0)  
Aneroid pressure h: -  
Speed rpm : 450  
Del.quantity cm3/ 1000 s: 123.0...125.0  
1000 s: (120.0...128.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1105...1115

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ 1000 s: 170.0...200.0  
1000 s: (166.0...204.0)

### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 9,6 u 4

Edition : 14.04.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 046 806

## Injection pump

Pump designation : PES6P110A720RS3104

EP type number : 0 412 016 712

## Governor

Governor design. : RQV300...1150PA850-4

Governer no. : 0 421 813 745

## Customer-spec. information

Customer : KHD

Engine : BF6L513RC

1st version kW : 210.0

Rated speed : 2300

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

### Test nozzle holder

assembly : 0 681 343 009

### Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

### Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

## (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 7.6...7.8

Del.quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (0.9...1.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.00...1.40

2nd speed rpm : 450

travel mm : 2.60...3.20

3rd speed rpm : 650

travel mm : 3.30...3.90

4th speed rpm : 1195

travel mm : 8.30...8.50

5th speed rpm : 1330

travel mm : 9.70...10.10

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1190

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1150

Aneroid pressure h: 900

Del.quantity : 165.0...167.0

1000 : (162.0...170.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

### 1st version

#### Control lever

position degrees: 52...60

#### Testing:

1st rack travel in: 13.00  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1315...1345  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

## LOW IDLE 1

### Control lever

position degrees: 19...27

#### Testing:

Speed rpm : 100  
Minimum rack trave: 9.20  
Speed rpm : 300  
Rack travel in mm : 7.60...7.80

## CONSTANT REGULATION

Speed rpm : 300...550

## TORQUE CONTROL

Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 750  
Rack travel in m: 14.20...14.40  
3rd speed rpm : 850  
Rack travel in m: 14.10...14.30

## Aneroid/Altitude Compensator Test

### 1st version

#### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.20...14.30

#### Measurement

Speed 1/min : 500

#### 1st pressure hPa : -

Rack travel in m: 12.40...12.60  
2nd pressure hPa : 510  
Rack travel in m: 13.70...13.80  
3rd pressure hPa : 375  
Rack travel in m: 12.70...12.90

## START CUT-OUT

Speed 1/min : 250 (270)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ 1000 s: 170.0...174.0  
1000 s: (168.0...176.0)  
Aneroid pressure h: -  
Speed rpm : 450  
Del.quantity cm<sup>3</sup>/ 1000 s: 123.0...125.0  
1000 s: (120.0...128.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1190...1200

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 170.0...200.0  
1000 s: (166.0...204.0)

#### Remarks:

:  
Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 11,7 a14  
 Edition : 08.05.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 807  
 Injection pump  
 Pump designation : PES6P110A820LS3131-1  
 EP type number : 0 412 016 717  
 Governor  
 Governor design. : RQV300..1100PA916  
 Governer no. : 0 421 813 748

### Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 168.0  
 Rated speed : 2200

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
 : (4.25...4.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.90...11.00

Del.quantity cm<sup>3</sup>/

100 s: (13.4...14.1)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 300.0

Rack travel in mm : 7.2...7.4

Del.quantity cm<sup>3</sup>/

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

### (B) Setting of injection pump with governor

#### GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.40  
 2nd speed rpm : 450  
 travel mm : 3.40...3.80  
 3rd speed rpm : 1150  
 travel mm : 7.90...8.30  
 4th speed rpm : 1225  
 travel mm : 9.10...9.70

#### GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1140  
 Rack travel in mm : 15.20...17.80

#### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Del.quantity : 137.0...139.0  
 1000 : (134.5...141.5)

Spread      cm<sup>3</sup> : 4.00  
1000 : (8.00)

Remarks:

#### RATED SPEED

1st version  
Control lever  
position degrees: 50...58

#### Testing:

1st rack travel in: 9.90  
Speed      rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed      rpm : 1185...1215  
4th rack travel in: 1250  
Speed      rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 20...28

#### Testing:

Speed      rpm : 200  
Minimum rack travel: 8.80  
Speed      rpm : 300  
Rack travel in mm : 7.20...7.40

#### CONSTANT REGULATION

Speed      rpm : 300...500

#### START CUT-OUT

Speed      1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed      rpm : 600  
Del.quantity cm<sup>3</sup>/ : 113.0...116.0  
1000 s: (110.0...119.0)  
Spread      cm<sup>3</sup> : 5.00  
1000 s: (9.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.90  
Speed      rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed      rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (126.0...154.0)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 a15

Edition : 08.05.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 046 808

## Injection pump

Pump designation : PES6P110A820LS3131-1

EP type number : 0 412 016 717

## Governor

Governor design. : RQV300..1100PA916-1

Governor no. : 0 421 813 749

## Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 177.0

Rated speed : 2200

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

### Overflow

quantity min. 1/h: 100...120

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test Lines : 1 680 750 015

### Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
: (4.25...4.45)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 13.9...13.9

100 s: (13.6...14.1)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 300.0

Rack travel in mm : 7.2...7.4

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.40

2nd speed rpm : 450

travel mm : 3.40...3.80

3rd speed rpm : 1150

travel mm : 7.90...8.30

4th speed rpm : 1225

travel mm : 9.10...9.70

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 139.0...139.0

1000 : (136.5...141.5)

Spread      cm<sup>3</sup> : 4.00  
              1000 : (8.00)

Remarks:

#### RATED SPEED

1st version  
Control lever  
position degrees: 50...58

#### Testing:

1st rack travel in: 9.90  
Speed      rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed      rpm : 1185...1215  
4th rack travel in: 1250  
Speed      rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 20...28

#### Testing:

Speed      rpm : 200  
Minimum rack travel: 8.80  
Speed      rpm : 300  
Rack travel in mm : 7.20...7.40

#### CONSTANT REGULATION

Speed      rpm : 300...500

#### START CUT-OUT

Speed      1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed      rpm : 600  
Del. quantity cm<sup>3</sup>/ : 116.0...119.0  
              1000 s: (113.0...122.0)  
Spread      cm<sup>3</sup> : 5.00  
              1000 s: (9.00)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed      rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed      rpm : 100  
Del. quantity cm<sup>3</sup>/ : 130.0...150.0  
              1000 s: (126.0...154.0)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 11,9 m

Edition : 28.04.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 046 809

## Injection pump

Pump designation : PES6P120A720LS3229

EP type number : 0 412 026 733

## Governor

Governor design. : RQ750PA661-2

Governor no. : 0 421 801 343

## Customer-spec. information

Customer : MAN

Engine : D2866LE

1st version kW : 230.0

Rated speed : 1500

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

### Test nozzle holder

assembly : 1 688 901 019

### Opening

pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 075

### Outside diameter

x Wall thickness

x Length mm : 8.00X2.50X1000

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90

: (3.75...3.95)

Rack travel in mm : 9.00...12.00

Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.40...14.50

Del.quantity cm<sup>3</sup>/ : 28.1...28.3

100 s: (27.8...28.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.7...7.3

Del.quantity cm<sup>3</sup>/ : 2.4...3.0

100 s: (2.1...3.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 281.0...283.0

1000 : (278.0...286.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

### Testing:

1st rack travel in: 13.40

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 787...800

4th rack travel in: 950

Speed rpm : 0.00...1.00

## INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:  
: MAN-NR. 2-7970

APPLICATION

Generator set

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 15,6 a  
 Edition : 2.5.89  
 Replaces : 2.84  
 Test oil : ISO-4113

Combination no. : 0 402 068 700

Injection pump  
 Pump designation : PES8P110A120RS3044  
 Governor  
 Governor design. : RSV400...1050P2/4350  
 R

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 8955 T

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.5

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6,00x1,50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1-5-6-3-4-2-7-8

Phasing : 0-45-90-135-180-225-

270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ 100 s: (14.3...15.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 750

Rack travel in mm : 12.00...12.20

Del.quantity cm<sup>3</sup>/ 100 s: (15.8...17.3)

Spread cm<sup>3</sup> : 0.6

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 680

Del.quantity 1000 : 147.0...149.0

Spread cm<sup>3</sup> : 4.0

1000 : (143.0...153.0)

## RATED SPEED

1st version

Control lever  
 position degrees: 40...48

Testing:

1st rack travel in: 10.10

Speed rpm : 1095...1105

2nd rack travel in: 4.00

Speed rpm : 1185...1215

4th rack travel in: 1275

Speed rpm : 0.30...1.70

## LOW IDLE 1

Control lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 100  
Minimum rack trave: 16.00  
Speed rpm : 400  
Rack travel in mm : 5.50...5.70  
Speed rpm : 800  
Maximum rack trave: 1.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 11.05...11.15  
2nd speed rpm : 750  
Rack travel in m: 11.95...12.25  
3rd speed rpm : 550  
Rack travel in m: 10.35...10.45

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 550  
Pressure hPa : 380  
Rack travel mm : 11.37...11.65

Measurement  
Speed 1/min : 550  
1st pressure hPa : 280  
Rack travel in m: 10.60...11.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 680  
Speed rpm : 750  
Del.quantity cm3/ : 164.0...167.0  
1000 s: (158.0...173.0)  
Spread cm3 : 6.0  
1000 s: (9.0)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 130.0...134.0  
1000 s: (124.0...140.0)  
Spread cm3 : 6.0  
1000 s: (9.0)

#### BREAKAWAY

1st version

B04

1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1095...1105  
STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...200.0  
1000 s: (-)

#### HIGH IDLE

1st version  
Speed rpm : 1155  
Del.quantity cm3/ : 37.0...47.0  
1000 s: (31.0...53.0)

#### LOW IDLE

Speed rpm : 400  
Del.quantity cm3/ : 22.0...28.0  
1000 s: (18.00...32.0)

#### Remarks:

Start-of-delivery mark 16° cam angle  
after start of delivery cyl. 8

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 10,0 m1

Edition : 14.04.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 075 701

## Injection pump

Pump designation : PES5P110A720LS3221

EP type number : 0 412 015 701

Governor

Governor design. : RSV350...1100POA487-8

Governer no. : 0 421 833 315

## Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM449

1st version kW : 147.0

Rated speed : 2200

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

### Overflow

quantity min. 1/h: 100...120

### Test nozzle holder

assembly : 0 681 343 009

### Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

### Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
(4.25...4.45)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 14.4...14.4

100 s: (14.1...14.6)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 350.0

Rack travel in mm : 6.3...6.7

Del.quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del.quantity : 144.0...144.0

1000 : (141.5...146.5)

Spread cm<sup>3</sup> : 4.00

1000 : (8.00)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

## Testing:

1st rack travel in: 10.50

Speed rpm : 1130...1140

2nd rack travel in: 4.00

Speed rpm : 1190...1220  
4th rack travel in: 1250  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

##### Control lever

position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.5  
Speed rpm : 350  
Rack travel in mm : 6.30...6.70  
Rack travel in mm : 2.00  
Speed rpm : 470...530

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 124.0...128.0  
1000 s: (121.0...131.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1130...1140

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VAL 7,2 a  
 Edition : 10.02.89  
 Replaces : 19.5.88  
 Test oil : ISO-4113

Combination no. : 0 402 076 056

Injection pump  
 Pump designation : PES6P110A320RS505  
 EP type number : 0 412 016 072  
 Governor  
 Governor design. : RSV325...1150POA522  
 Governer no. : 0 421 833 242

## Customer-spec. information

Customer : VALMET

Engine : 612 DSJ

1st version kW : 165.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 13.8...14.1

100 s: (13.5...14.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 325.0

Rack travel in mm : 7.4...7.6

Del.quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (0.9...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 700

Del.quantity : 138.0...141.0

1000 : (135.5...143.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

### 1st version

Control lever

position degrees: 40...48

## Testing:

1st rack travel in: 11.00

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1290...1310  
4th rack travel in: 1460  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.0

#### Testing:

Speed rpm : 100  
Minimum rack trave: 9.00  
Speed rpm : 325  
Rack travel in mm : 7.40...7.60  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 700  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 1150  
Rack travel in m: 11.90...12.10

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.00...12.10

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 400  
Rack travel in m: 11.50...11.60  
3rd pressure hPa : 270  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 102.0...105.0  
1000 s: (99.5...107.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 7.40...7.60  
Del.quantity cm<sup>3</sup>/ : 12.0...16.0  
1000 s: (9.5...18.5)

Spread cm<sup>3</sup> : 3.00  
1000 s: (6.00)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

#### APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 y 1  
 Edition : 07.04.89  
 Replaces : 20.12.88  
 Test oil : ISO-4113

Combination no. : 0 402 076 722

Injection pump  
 Pump designation : PES6P120A720RS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV400...1100P2A534  
 Governor no. : 0 421 833 275

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6466 HF-050

1st version kW : 194.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/

100 s: (15.4...16.1)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 4.8...5.0

Del.quantity cm<sup>3</sup>/

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h:

Del.quantity : 156.5...158.5

1000 : (154.0...161.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 11.00  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1200...1210  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.4

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 540...600

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 750  
Rack travel in m: 12.80...13.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.50

Measurement  
Speed 1/min : 500  
1st pressure hPa : 605  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 780  
Rack travel in m: 12.10...12.50  
3rd pressure hPa : 1200  
Rack travel in m: 12.80...13.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 174.5...179.5  
1000 s: (172.0...182.0)  
Aneroid pressure h: -  
Speed rpm : 800

Del.quantity cm3/ : 117.5...121.5  
1000 s: (114.5...124.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:  
: JOHN DEERE # RE32035  
Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 ✓  
 Edition : 07.04.89  
 Replaces : 20.12.88  
 Test oil : ISO-4113

Combination no. : 0 402 076 723

Injection pump  
 Pump designation : PES6P120A720RS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV400...1100P2A534-1  
 Governer no. : 0 421 833 276

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6466 AF-050

1st version kW : 180.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.80...11.90

Del.quantity cm<sup>3</sup>/ : 15.0...15.2

100 s: (14.7...15.4)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 4.8...5.0

Del.quantity cm<sup>3</sup>/ : 1.7...2.2

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 150.0...152.0

1000 : (147.5...154.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

**Testing:**

1st rack travel in: 10.80  
 Speed rpm : 1145...1155  
 2nd rack travel in: 4.00  
 Speed rpm : 1200...1210  
 4th rack travel in: 1350  
 Speed rpm : 0.30...1.40

**LOW IDLE 1**

Control lever  
 position degrees: 16...24  
 Setting point w/out bumper spring  
 Speed rpm : 400  
 Rack travel in mm : 4.4

**Testing:**

Speed rpm : 100  
 Minimum rack travel: 19.00  
 Speed rpm : 400  
 Rack travel in mm : 4.80...5.00  
 Rack travel in mm : 2.00  
 Speed rpm : 540...600

**TORQUE CONTROL**

Torque control curve - 1st version  
 1st speed rpm : 1100  
 Rack travel in m: 11.80...11.90  
 2nd speed rpm : 700  
 Rack travel in m: 12.60...12.80

**Aneroid/Altitude  
Compensator Test****1st version**

Setting  
 Speed rpm : 500  
 Pressure hPa : 1200  
 Rack travel mm : 12.60...12.80

**Measurement**

Speed 1/min : 500

1st pressure hPa : -  
 Rack travel in m: 10.40...10.60  
 2nd pressure hPa : 720  
 Rack travel in m: 11.00...11.10  
 3rd pressure hPa : 895  
 Rack travel in m: 11.80...12.20

**FUEL DELIVERY CHARACTERISTICS****1st version**

Aneroid pressure h: 1200  
 Speed rpm : 700  
 Del.quantity cm<sup>3</sup>/ : 173.5...178.5  
 1000 s: (171.0...181.0)  
 Aneroid pressure h: -  
 Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 120.0...124.0  
 1000 s: (117.0...127.0)

**BREAKAWAY**

1st version  
 1mm rack travel less than

full load rack tr: 10.80  
 Speed rpm : 1145...1155

**STARTING FUEL DELIVERY**

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
 1000 s: (85.0...115.0)  
 Rack travel in mm : 20.00...21.00

**LOW IDLE**

Speed rpm : 400  
 Rack travel in mm : 4.80...5.00  
 Del.quantity cm<sup>3</sup>/ : 17.5...22.5  
 1000 s: (15.0...25.0)  
 Spread cm<sup>3</sup> : 4.50  
 1000 s: (7.50)

**Remarks:**

: JOHN DEERE # RE32033

Adjustment without torque-control  
 spring retainer with 0,5 mm less  
 control-rod travel. Increase in  
 full-load delivery with torque-control  
 spring retainer.

Starting/full-load transition speed  
 from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
 after start of delivery cyl. 1

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 10,1 f  
 Edition : 07.04.89  
 Replaces : 30.9.88  
 Test oil : ISO-4113

Combination no. : 0 402 076 726

Injection pump  
 Pump designation : PES6P110A720RS3209  
 EP type number : 0 412 016 722  
 Governor  
 Governor design. : RSV400...1050POA537  
 Governor no. : 0 421 833 287

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6619 AT 06

1st version kW : 172.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55  
 : (3.40...3.60)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.20...11.30

Del.quantity cm<sup>3</sup>/ : 16.7...16.9

100 s: (16.5...17.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 5.0...5.2

Del.quantity cm<sup>3</sup>/ : 1.6...2.1

100 s: (1.3...2.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 1050

Del.quantity : 167.5...169.5

1000 : (165.0...172.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

## 1st version

Control lever

position degrees: 39...47

## Testing:

1st rack travel in: 10.20

Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1150...1160

3rd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.6

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 2.00  
Speed rpm : 520...580

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 700  
Rack travel in m: 11.60...11.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 171.5...176.5  
1000 s: (169.0...179.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 175.0...195.0  
1000 s: (170.0...200.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.00...5.20  
Del.quantity cm<sup>3</sup>/ : 16.0...21.0  
1000 s: (13.5...23.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:  
: JOHN DEERE # RE33898

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark at 14° angular  
displacement of the cam after start of  
delivery of cylinder 1 with control-rod  
travel = 10.50 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,7 b  
 Edition : 07.04.89  
 Replaces : 30.9.88  
 Test oil : ISO-4113

Combination no. : 0 402 076 727

Injection pump  
 Pump designation : PES6P120A720RS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV400...1100P2A534-  
 2  
 Governer no. : 0 421 833 290

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6076AF

1st version kW : 160.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 13.4...13.6

100 s: (13.1...13.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 4.8...5.0

Del.quantity cm<sup>3</sup>/ : 1.7...2.2

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 134.0...136.0

1000 : (131.5...138.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

### Testing:

1st rack travel in: 10.10  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1200...1210  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

### LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.4

### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 540...600

### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 700  
Rack travel in m: 12.40...12.60

### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.50...10.70

#### Measurement

Speed 1/min : 500

1st pressure hPa : 470  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 605  
Rack travel in m: 11.80...12.20  
3rd pressure hPa : 900  
Rack travel in m: 12.40...12.60

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 165.5...170.5  
1000 s: (163.0...173.0)

Aneroid pressure h: -

Speed rpm : 800

Del.quantity cm3/ : 122.0...126.0  
1000 s: (121.0...131.0)

### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1145...1155

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks: : JOHN DEERE # RE32034

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,7 c  
 Edition : 07.04.89  
 Replaces : 20.12.88  
 Test oil : ISO-4113

Combination no. : 0 402 076 728

Injection pump  
 Pump designation : PES6P120A720RS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV425...1050P2A489-  
 2  
 Governor no. : 0 421 833 291

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6076 HRW01

1st version kW : 175.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 16.0...16.2

100 s: (15.7...16.4)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 425.0

Rack travel in mm : 4.8...5.0

Del.quantity cm<sup>3</sup>/ : 1.7...2.2

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1200

Del.quantity : 160.0...162.0

1000 : (157.5...164.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:  
 1st rack travel in: 11.20  
 Speed rpm : 1090...1100  
 2nd rack travel in: 4.00  
 Speed rpm : 1160...1170  
 4th rack travel in: 1250  
 Speed rpm : 0.30...1.40

LOW IDLE 1  
 Control lever  
 position degrees: 16...24  
 Setting point w/out bumper spring  
 Speed rpm : 425  
 Rack travel in mm : 4.4

Testing:  
 Speed rpm : 100  
 Minimum rack travel: 19.00  
 Speed rpm : 425  
 Rack travel in mm : 4.80...5.00  
 Rack travel in mm : 2.00  
 Speed rpm : 570...630

TORQUE CONTROL  
 Torque control curve - 1st version  
 1st speed rpm : 1050  
 Rack travel in m: 12.20...12.30  
 2nd speed rpm : 600  
 Rack travel in m: 13.40...13.60

Aneroid/Altitude  
 Compensator Test

1st version  
 Setting  
 Speed rpm : 500  
 Pressure hPa : 1200  
 Rack travel mm : 13.40...13.60

Measurement  
 Speed 1/min : 500

1st pressure hPa : -  
 Rack travel in m: 12.10...12.30  
 2nd pressure hPa : 725  
 Rack travel in m: 12.50...12.60  
 3rd pressure hPa : 815  
 Rack travel in m: 12.90...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
 Aneroid pressure h: 1200  
 Speed rpm : 600  
 Del.quantity cm3/ : 191.0...196.0  
 1000 s: (188.5...198.5)  
 Aneroid pressure h: -  
 Speed rpm : 800

Del.quantity cm3/ : 157.0...161.0  
 1000 s: (154.0...164.0)

#### BREAKAWAY

1st version  
 1mm rack travel less than  
 full load rack tr: 11.20  
 Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm3/ : 90.0...110.0  
 1000 s: (85.0...115.0)  
 Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 425  
 Rack travel in mm : 4.80...5.00  
 Del.quantity cm3/ : 17.5...22.5  
 1000 s: (15.0...25.0)  
 Spread cm3 : 4.50  
 1000 s: (7.50)

Remarks: : JOHN DEERE # RE32888

Adjustment without torque-control  
 spring retainer with 0,5 mm less  
 control-rod travel. Increase in  
 full-load delivery with torque-control  
 spring retainer.

Starting/full-load transition speed  
 from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
 after start of delivery cyl. 1

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 10,1 g

Edition : 07.04.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 076 730

## Injection pump

Pump designation : PES6P110A720RS3217

EP type number : 0 412 016 724

## Governor

Governor design. : RSV550...1050P2A534-3

Governor no. : 0 421 833 304

## Customer-spec. information

Customer : JOHN DEERE

Engine : 6619AT07

1st version kW : 201.0

## TEST BENCH REQUIREMENTS

## Test oil

inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 015

## Outside diameter

x Wall thickness

x Length mm : 6.00X3.00X600

## (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55

: (3.40...3.60)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.70...11.80

Del.quantity cm<sup>3</sup>/ : 18.6...18.8

100 s: (18.3...19.0)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 550.0

Rack travel in mm : 5.2...5.4

Del.quantity cm<sup>3</sup>/ : 3.1...3.6

100 s: (2.9...3.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 1050

Aneroid pressure h: 900

Del.quantity : 186.0...188.0

1000 : (183.5...190.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

## 1st version

Control lever

position degrees: 39...47

## Testing:

1st rack travel in: 10.70

Speed rpm : 1095...1105

2nd rack travel in: 4.00

Speed rpm : 1165...1175  
4th rack travel in: 1275  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 4.8

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 550  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 680...740

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 700  
Rack travel in m: 12.50...12.70

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.50...12.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 425  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 675  
Rack travel in m: 12.00...12.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 201.5...206.5  
1000 s: (199.0...209.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 158.0...162.0  
1000 s: (155.0...165.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 1095...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 165.0...185.0  
1000 s: (160.0...190.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 550  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 31.5...36.5  
1000 s: (29.0...39.0)  
Spread cm3 : 4.50  
1000 s: (7.50)

#### Remarks:

: JOHN DEERE # RE36078

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 10,1 g1  
 Edition : 07.04.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 731  
 Injection pump  
 Pump designation : PES6P110A720RS3217  
 EP type number : 0 412 016 724  
 Governor  
 Governor design. : RSV400...1050P2A534-4  
 Governer no. : 0 421 833 305  
 Customer-spec. information  
 Customer : JOHN DEERE  
 Engine : 6101 H  
 1st version kW : 224.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 0 681 343 009  
 Opening pressure, bar : 172...175  
 Test Lines : 1 680 750 015  
 Outside diameter x Wall thickness x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant. per values

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55  
 : (3.40...3.60)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1050  
 Rack travel in mm : 12.90...13.00  
 Del.quantity cm<sup>3</sup>/ : 21.2...21.4  
 100 s: (20.9...21.6)

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.5...5.7  
 Del.quantity cm<sup>3</sup>/ : 2.6...3.1  
 100 s: (2.3...3.3)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 1200  
 Del.quantity : 212.0...214.0  
 1000 : (209.5...216.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

**RATED SPEED**

1st version  
 Control lever position degrees: 36...44

Testing:  
 1st rack travel in: 11.90  
 Speed rpm : 1090...1100

2nd rack travel in: 4.00  
Speed rpm : 1165...1175  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.1

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 570...630

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.70...13.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.70...13.90

Measurement  
Speed 1/min : 500  
1st pressure hPa : -  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 325  
Rack travel in m: 11.60...11.70  
3rd pressure hPa : 640  
Rack travel in m: 12.90...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 228.0...233.0  
1000 s: (225.5...235.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 160.0...164.0  
1000 s: (157.0...167.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 165.0...185.0  
1000 s: (160.0...190.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 26.0...31.0  
1000 s: (23.5...33.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks: : JOHN DEERE # RE36881

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,7 g  
 Edition : 07.04.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 733  
 Injection pump  
 Pump designation : PES6P110A720RS3224  
 EP type number : 0 412 016 726  
 Governor  
 Governor design. : RSV475...1050P2A534-5  
 Governer no. : 0 421 833 313  
 Customer-spec. information  
 Customer : JOHN DEERE  
 Engine : 6101 AT 001  
 1st version kW : 170.0  
 Rated speed : 2100  
**TEST BENCH REQUIREMENTS**  
 Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 0 681 343 009  
 Opening pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter x Wall thickness x Length mm : 6.00x3.00x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_  
**BEGINNING OF DELIVERY**  
 Test pressure, bar: 27...29  
 Prestroke mm : 3.35...3.45  
 : (3.30...3.50)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 15.9...16.1

100 s: (15.7...16.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 475.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 700

Del.quantity : 159.5...161.5

1000 : (157.5...163.5)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 34...42

Testing:

1st rack travel in: 11.90

Speed rpm : 1090...1100

2nd rack travel in: 4.00  
Speed rpm : 1150...1160  
3rd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1250  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 475  
Rack travel in mm : 4.9

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 475  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 600...660

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.90...13.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 145  
Rack travel in m: 11.50...11.60  
3rd pressure hPa : 290  
Rack travel in m: 12.30...12.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 113.0...117.0  
1000 s: (111.0...119.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 175.0...195.0  
1000 s: (170.0...200.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 475  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 9.5...13.5  
1000 s: (7.0...16.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks: : JOHN DEERE # RE39856

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark at 14° angular  
displacement of the cam after start of  
delivery of cylinder 1 with control-rod  
travel = 10.50 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,8 r  
 Edition : 29.03.89

Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 076 734

Injection pump  
 Pump designation : PES6P110A820LS3131-1  
 EP type number : 0 412 016 717  
 Governor  
 Governor design. : RSV350..1100POA487-9  
 Governor no. : 0 421 833 316

## Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 168.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
 : (4.25...4.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 13.5...13.7

100 s: (13.2...13.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 350.0

Rack travel in mm : 6.8...7.1

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del.quantity : 135.0...137.0

1000 : (132.5...139.5)

Spread cm<sup>3</sup> : 4.00

1000 : (8.00)

## RATED SPEED

1st version

Control lever

position degrees: 45...53

Testing:

1st rack travel in: 10.00

Speed rpm : 1130...1140  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1350  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.9

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 350  
Rack travel in mm : 6.80...7.00  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 111.0...115.0  
1000 s: (108.0...118.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 1130...1140

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

#### Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 22,0 b  
 Edition : 31.03.89  
 Replaces : 27.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 640 812

Injection pump  
 Pump designation : PE12P120A520LS7820  
 EP type number : 0 412 620 814  
 Governor  
 Governor design. : RQV350...1150PA870-4  
 Governor no. : 0 421 813 717

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM 444 LA

1st version kW : 736.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 14.30...14.40

Del.quantity cm<sup>3</sup>/ : 31.0...31.2

100 s: (30.7...31.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...6.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.00...1.50

2nd speed rpm : 500  
 travel mm : 2.60...3.00

3rd speed rpm : 750  
 travel mm : 3.60...4.00

4th speed rpm : 1190  
 travel mm : 6.70...7.10

5th speed rpm : 1275  
 travel mm : 8.20...8.70

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1275

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1150  
Aneroid pressure h: 1800  
Del.quantity : 310.0...312.0  
1000 : (307.0...315.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

### RATED SPEED

### 1st version

Control lever  
position degrees: 60...68

### Testing:

1st rack travel in: 13.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control lever  
position degrees: 10...18

### Testing:

Speed rpm : 200  
Minimum rack trave: 6.30  
Speed rpm : 350  
Rack travel in mm : 5.00...5.60  
Rack travel in mm : 7.00  
Speed rpm : 250...0  
Speed rpm : 500  
Maximum rack trave: 3.00

### CONSTANT REGULATION

Speed rpm : 350...600

### Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 6.30...6.60

### Measurement

Speed 1/min : 500

1st pressure hPa : 400  
Rack travel in m: 7.70...7.80  
2nd pressure hPa : 1200  
Rack travel in m: 11.90...12.20

### START CUT-OUT

Speed 1/min : 310 (330)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1800  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/s : 301.0...311.0  
1000 s: (298.0...314.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (15.0)  
Aneroid pressure h: 1800  
Speed rpm : 1150  
Del.quantity cm<sup>3</sup>/s : 240.0...243.0 \*  
1000 s: (237.0...246.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (15.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/s : 94.0...96.0  
1000 s: (91.0...99.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (15.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1190...1200

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/s : 330.0...350.0  
1000 s: (326.0...354.0)

### Remarks:

:

\* = Set at reduced-delivery stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 b  
 Edition : 31.03.89  
 Replaces : 10.2.89  
 Test oil : ISO-4113

Combination no. : 0 402 646 836

Injection pump  
 Pump designation : PE6P120A720RS7126  
 EP type number : 0 412 626 815  
 Governor  
 Governor design. : RQV200...1000PA725-1  
 Governor no. : 0 421 813 552

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DSC11 18

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.10...14.20

Del.quantity cm<sup>3</sup>/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.5...4.9

Del.quantity cm<sup>3</sup>/ : 1.5...1.9

100 s: (-)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 225

travel mm : 1.20...1.60

2nd speed rpm : 350

travel mm : 2.40...3.00

3rd speed rpm : 650

travel mm : 4.40...5.00

4th speed rpm : 1045

travel mm : 8.40...8.60

5th speed rpm : 1160

travel mm : 9.90...10.30

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 234.0...236.0

1000 : (231.0...239.0)

Spread      cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 13.10  
Speed      rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed      rpm : 1145...1175  
4th rack travel in: 1300  
Speed      rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed      rpm : 100  
Minimum rack travel: 6.10  
Speed      rpm : 225  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed      rpm : 340...400

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed      rpm : 500  
Pressure    hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed      1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.50...10.90  
2nd pressure hPa : 575  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 405  
Rack travel in m: 11.10...11.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed      rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 223.0...231.0  
1000 s: (221.0...233.0)  
Aneroid pressure h: -  
Speed      rpm : 500

Del.quantity cm<sup>3</sup>/ : 150.0...154.0  
1000 s: (148.0...156.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.10  
Speed      rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed      rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed      rpm : 225  
Rack travel in mm : 4.50...4.70

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-21

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,0 t 2  
 Edition : 03.03.89  
 Replaces : 25.3.88  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 646 843  
  
 Injection pump  
 Pump designation : PE6P120A320LS7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQV300...1050PA797-2  
 Governer no. : 0 421 813 614  
  
 Customer-spec. information  
 Customer : DAIMLER-BENZ  
  
 Engine : OM441 LA  
  
 1st version kW : 240.0  
 Rated speed : 2100  
  
**TEST BENCH REQUIREMENTS**  
  
 Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve : 1 417 413 025  
  
 Inlet press., bar : 1.50  
  
 Overflow  
 quantity min. 1/h: 100...120  
  
 Test nozzle holder  
 assembly : 1 688 901 019  
  
 Opening  
 pressure, bar : 207...210  
  
 Orifice plate  
 diameter mm : 0,8  
  
 Test lines : 1 680 750 067  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000  
  
**(A) Injection pump setting values**  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm<sup>3</sup>/ : 21.1...21.3

100 s: (20.8...21.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.40  
 2nd speed rpm : 600  
 travel mm : 4.90...5.10  
 3rd speed rpm : 1075  
 travel mm : 7.40...7.60  
 4th speed rpm : 1100  
 travel mm : 8.00...8.40  
 5th speed rpm : 1150  
 travel mm : 9.00...9.40

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.80...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 211.0...213.0  
1000 : (208.0...216.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

### RATED SPEED

#### 1st version

Control lever  
position degrees: 50...58

#### Testing:

1st rack travel in: 13.80  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 15...23

#### Testing:

Speed rpm : 200  
Minimum rack trave: 7.90  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00

### CONSTANT REGULATION

Speed rpm : 300...450

### TORQUE CONTROL

Dimension a mm : 0.30  
2nd speed rpm : 1050  
Rack travel in m: 14.80...15.00  
3rd speed rpm : 800  
Rack travel in m: 15.00...15.20  
4th speed rpm : 700

### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

#### Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 550  
Rack travel in m: 12.70...12.90

#### 3rd pressure hPa : 1050

Rack travel in m: 14.00...14.10 \*  
4th pressure hPa : 1150  
Rack travel in m: 14.40...14.60  
5th pressure hPa : -  
Rack travel in m: 9.00...9.30

### START CUT-OUT

Speed 1/min : 220 (240)

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1450  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 236.0...239.0  
1000 s: (233.0...242.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1450  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 242.0...246.0  
1000 s: (239.0...249.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 133.0...135.0  
1000 s: (130.0...138.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 1095...1110

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...210.0  
1000 s: (186.0...214.0)  
Rack travel in mm : 200.00...220.00

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 9,0 m  
 Edition : 17.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 853  
 Injection pump  
 Pump designation : PE6P120A320RS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RQ200/1100PA873  
 Governer no. : 0 421 801 415  
 Customer-spec. information  
 Customer : SAAB-SCANIA  
 Engine : DS9 05

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 019  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test Lines : 1 680 750 015  
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 4.40...4.50  
 : (4.35...5.55)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 5.1...5.7

Del.quantity cm<sup>3</sup>/ : 2.1...2.5

100 s: (-)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 48...50

Speed rpm : 600

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 165.0...167.0

1000 : (162.0...170.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.5

Testing:

1st rack travel in: 11.20

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1275...1305

4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.40  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 310...350

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.20...12.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...11.00  
2nd pressure hPa : 360  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 240  
Rack travel in m: 11.00...11.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 125.0...129.0  
1000 s: (123.0...131.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### APPLICATION

#### Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 h  
 Edition : 31.03.89  
 Replaces : 10.2.89  
 Test oil : ISO-4113

Combination no. : 0 402 646 858

Injection pump  
 Pump designation : PE6P120A720RS7151  
 EP type number : 0 412 626 824  
 Governor  
 Governor design. : RQ200/900PA713-4  
 Governor no. : 0 421 801 424

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DSCII 04

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.8...5.2

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (-)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225

travel mm : 1.20...1.60

2nd speed rpm : 350

travel mm : 2.80...3.40

3rd speed rpm : 650

travel mm : 3.70...4.30

4th speed rpm : 950

travel mm : 4.60...4.80

5th speed rpm : 1065

travel mm : 6.40...6.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread      cm<sup>3</sup> : 6.00  
              1000 : (9.00)

#### RATED SPEED

##### 1st version

###### Setting point:

Speed      rpm : 600  
Rack travel in mm : 16.5

###### Testing:

1st rack travel in: 11.70  
Speed      rpm : 945...960  
2nd rack travel in: 4.00  
Speed      rpm : 1050...1080  
4th rack travel in: 1200  
Speed      rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed      rpm : 225  
Rack travel in mm : 4.9

###### Testing:

Speed      rpm : 100  
Minimum rack trave: 6.40  
Speed      rpm : 225  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed      rpm : 310...350

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed      rpm : 500  
Pressure    hPa : 900  
Rack travel mm : 12.70...12.80

##### Measurement

Speed      1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.40...11.80  
2nd pressure hPa : 395  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 345  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 900  
Speed      rpm : 900  
Del.quantity cm<sup>3</sup>/ : 171.0...179.0  
1000 s: (169.0...181.0)

Aneroid pressure h: -  
Speed      rpm : 500  
Del.quantity cm<sup>3</sup>/ : 145.0...149.0  
1000 s: (143.0...151.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed      rpm : 945...960

#### LOW IDLE

Speed      rpm : 225  
Rack travel in mm : 4.80...5.00

##### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 3.0...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Sep. 5, 1988

Start of delivery - engine: 9° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a 1  
 Edition : 24.02.89  
 Replaces : 22.4.88  
 Test oil : ISO-4113

Combination no. : 0 402 648 812

Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RQ300/1050PA717  
 Governor no. : 0 421 801 258

## Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM442 LA

1st version kW : 320.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.70...14.90

Del.quantity cm<sup>3</sup>/ : 22.0...22.2

100 s: (21.7...22.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.7

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 680

Del.quantity : 220.0...222.0

1000 : (217.0...225.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.40  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:

Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.10...6.70  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.90  
2nd speed rpm : 1050  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 850  
Rack travel in m: 15.80...16.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 680  
Rack travel mm : 14.70...14.90

Measurement

Speed 1/min : 600

1st pressure hPa : 310  
Rack travel in m: 12.10...12.30  
2nd pressure hPa : 470  
Rack travel in m: 13.70...13.90  
3rd pressure hPa : 820  
Rack travel in m: 14.90...15.00  
4th pressure hPa : 1100  
Rack travel in m: 15.90...16.00  
5th pressure hPa : -  
Rack travel in m: 11.40...11.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1150  
Speed rpm : 1050  
Del.quantity cm3/ : 229.0...232.0  
1000 s: (226.0...235.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1150  
Speed rpm : 850  
Del.quantity cm3/ : 247.0...251.0  
1000 s: (244.0...254.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.40  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a 4  
 Edition : 28.11.88  
 Replaces : 27.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 648 817

Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RG300/1050PA762-5  
 Governer no. : 0 421 801 399

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 A

1st version kW : 260.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.10...14.30

Del.quantity cm3/ : 20.3...20.5

100 s: (20.0...20.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 650

Del.quantity : 203.0...205.0

1000 : (200.0...208.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.80  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.75  
2nd speed rpm : 1050  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 850  
Rack travel in m: 13.70...14.00  
4th speed rpm : 700  
Rack travel in m: 14.40...14.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 400  
Rack travel in m: 13.40...13.70  
3rd pressure hPa : 850  
Rack travel in m: 14.20...14.30 \*  
4th pressure hPa : -  
Rack travel in m: 11.40...11.70  
5th pressure hPa : 1050  
Rack travel in m: 14.40...14.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1050  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 180.0...183.0  
1000 s: (177.0...186.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 215.0...219.0  
1000 s: (212.0...222.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 206.0...210.0  
1000 s: (203.0...213.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a 5  
 Edition : 29.03.89  
 Replaces : 3.3.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 825

Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RQV300..1050PA797-3  
 Governer no. : 0 421 813 627

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 A

1st version kW : 260.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.10...14.30

Del.quantity cm<sup>3</sup>/ : 20.3...20.5

100 s: (20.0...20.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.40

2nd speed rpm : 600

travel mm : 4.90...5.10

3rd speed rpm : 1075

travel mm : 7.40...7.60

4th speed rpm : 1100

travel mm : 8.00...8.20

5th speed rpm : 1150

travel mm : 9.00...9.20

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 500  
 Aneroid pressure h: 650  
 Del.quantity : 203.0...205.0  
 1000 : (200.0...208.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

#### RATED SPEED

1st version  
 Control lever  
 position degrees: 51...59

#### Testing:

1st rack travel in: 11.80  
 Speed rpm : 1090...1100  
 2nd rack travel in: 4.00  
 Speed rpm : 1155...1185  
 4th rack travel in: 1300  
 Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
 position degrees: 13...21

#### Testing:

Speed rpm : 200  
 Minimum rack trave: 7.70  
 Speed rpm : 300  
 Rack travel in mm : 6.00...6.40

#### CONSTANT REGULATION

Speed rpm : 300...450

#### TORQUE CONTROL

Dimension a mm : 1.40  
 2nd speed rpm : 1050  
 Rack travel in m: 12.70...12.90  
 3rd speed rpm : 850  
 Rack travel in m: 13.70...14.00  
 4th speed rpm : 700  
 Rack travel in m: 14.30...14.50

#### Aneroid/Altitude Compensator Test

1st version  
 Setting  
 Speed rpm : 600  
 Pressure hPa : 650  
 Rack travel mm : 14.10...14.30

Measurement  
 Speed 1/min : 600

1st pressure hPa : 300  
 Rack travel in m: 12.40...12.60

2nd pressure hPa : 400  
 Rack travel in m: 13.40...13.70  
 3rd pressure hPa : 850  
 Rack travel in m: 14.20...14.30 \*  
 4th pressure hPa : -  
 Rack travel in m: 11.30...11.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
 Aneroid pressure h: 1050  
 Speed rpm : 1050  
 Del.quantity cm<sup>3</sup>/ : 180.0...183.0  
 1000 s: (177.0...186.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: 1050  
 Speed rpm : 700  
 Del.quantity cm<sup>3</sup>/ : 215.0...219.0  
 1000 s: (212.0...222.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: 1050  
 Speed rpm : 850  
 Del.quantity cm<sup>3</sup>/ : 206.0...210.0  
 1000 s: (203.0...213.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: -  
 Speed rpm : 500  
 Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
 1000 s: (146.0...154.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)

#### BREAKAWAY

1st version  
 1mm rack travel less than

full load rack tr: 11.80  
 Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 175.0...190.0  
 1000 s: (171.0...194.0)

#### Remarks:

:

\* Increase in control-rod travel with

respect to setting at least 0.1 mm





Spread      cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

#### Testing:

1st rack travel in: 11.60  
Speed      rpm : 990...1000  
2nd rack travel in: 4.00  
Speed      rpm : 1090...1120  
4th rack travel in: 1250  
Speed      rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 7...15

#### Testing:

Speed      rpm : 100  
Minimum rack travel: 6.50  
Speed      rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed      rpm : 360...420

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed      rpm : 500  
Pressure    hPa : 900  
Rack travel mm : 12.60...12.70

Measurement  
Speed      1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.10...11.50  
2nd pressure hPa : 215  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed      rpm : 950  
Del.quantity cm<sup>3</sup>/ : 184.0...192.0  
1000 s: (182.0...194.0)  
Aneroid pressure h: -  
Speed      rpm : 500  
Del.quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed      rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed      rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed      rpm : 225  
Rack travel in mm : 4.90...5.10

#### Remarks:

:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1986-09-16

Start of delivery - engine: 17° before  
TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 14,7 a 9  
 Edition : 28.04.89  
 Replaces : 2.12.86  
 Test oil : ISO-4113

Combination no. : 0 402 648 842

Injection pump  
 Pump designation : PE8P120A320LS7801-1  
 EP type number : 0 412 628 818  
 Governor  
 Governor design. : RQV350..950PA866-2  
 Governor no. : 0 421 813 673

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 A

1st version kW : 275.0  
 Rated speed : 1900

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm : 930

Rack travel in mm : 13.50...13.60

Del.quantity cm<sup>3</sup>/ : 21.1...21.3

100 s: (20.8...21.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

### (B) Setting of injection pump with governor

#### GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.60...0.80

2nd speed rpm : 425  
 travel mm : 2.40...2.60

3rd speed rpm : 800  
 travel mm : 5.30...5.60

4th speed rpm : 1000  
 travel mm : 7.80...8.20

5th speed rpm : 1120  
 travel mm : 9.50...10.00

#### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : ?

Rack travel in mm : 16.50...18.00

#### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 930  
 Aneroid pressure h: 950  
 Del.quantity : 211.0...213.0  
 1000 : (208.0...216.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

#### RATED SPEED

1st version  
 Control lever  
 position degrees: 60...68

Testing:  
 1st rack travel in: 12.50  
 Speed rpm : 980...990  
 2nd rack travel in: 4.00  
 Speed rpm : 1080...1110  
 4th rack travel in: 1300  
 Speed rpm : 0.00...1.00

LOW IDLE 1  
 Control Lever  
 position degrees: 8...16

Testing:  
 Speed rpm : 250  
 Minimum rack trave: 7.60  
 Speed rpm : 350  
 Rack travel in mm : 5.00...5.50

CONSTANT REGULATION  
 Speed rpm : 350...500

TORQUE CONTROL  
 Dimension a mm : 1.10  
 Torque control curve - 1st version  
 1st speed rpm : 950  
 Rack travel in m: 13.50...13.60  
 2nd speed rpm : 800  
 Rack travel in m: 14.60...14.80  
 3rd speed rpm : 875  
 Rack travel in m: 13.80...14.00

#### Aneroid/Altitude Compensator Test

1st version  
 Setting  
 Speed rpm : 600  
 Pressure hPa : -  
 Rack travel mm : 10.50...10.90

Measurement  
 Speed 1/min : 600

1st pressure hPa : 450

Rack travel in m: 11.30...11.50  
 2nd pressure hPa : 700  
 Rack travel in m: 13.40...13.60

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
 Aneroid pressure h: 950  
 Speed rpm : 800  
 Del.quantity cm<sup>3</sup>/ : 233.0...237.0  
 1000 s: (230.0...240.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: 950  
 Speed rpm : 930  
 Del.quantity cm<sup>3</sup>/ : 167.0...169.0 \*  
 1000 s: (164.0...172.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: -  
 Speed rpm : 500  
 Del.quantity cm<sup>3</sup>/ : 143.0...145.0  
 1000 s: (140.0...148.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)

#### BREAKAWAY

1st version  
 1mm rack travel less than  
 full load rack tr: 12.50  
 Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 190.0...210.0  
 1000 s: (186.0...214.0)

#### Remarks:

:

\* = Set at reduced-delivery stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 14.5 e  
 Edition : 07.04.89  
 Replaces : 4.11.88  
 Test oil : ISO-4113

Combination no. : 0 402 648 851

Injection pump  
 Pump designation : PE8P120A520LS7818  
 EP type number : 0 412 628 830  
 Governor  
 Governor design. : RQV250...1150PA902  
 Governor no. : 0 421 813 720

## Customer-spec. information

Customer : MAN  
 Engine : D2848LXE 40

1st version kW : 500.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.50...13.60

Del.quantity cm<sup>3</sup>/ : 28.9...29.1

100 s: (28.6...29.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250

Rack travel in mm : 7.30...7.50

Del.quantity cm<sup>3</sup>/ : 5.2...6.0 \*

100 s: (-)

3rd speed rpm : 500

Rack travel in mm : 8.20...8.40

Del.quantity cm<sup>3</sup>/ : <125.0 \*\*

100 s: (-)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed	rpm	: 250
travel mm		: 1.40...1.60
2nd speed	rpm	: 450
travel mm		: 3.40...4.00
3rd speed	rpm	: 850
travel mm		: 6.30...6.90
4th speed	rpm	: 1150
travel mm		: 9.40...9.60
5th speed	rpm	: 1450
travel mm		: 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1210

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 289.0...291.0  
1000 : (286.0...294.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

#### Testing:

1st rack travel in: 12.50  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1280...1310  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control lever  
position degrees: 19...27

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

### Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.50...13.60

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 100  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 470  
Rack travel in m: 11.90...12.20

### START CUT-OUT

Speed 1/min : 200 (220)

### FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)

### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1190...1200

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

### LOW IDLE

Speed rpm : 500  
Rack travel in mm : <7.50  
Del.quantity cm<sup>3</sup>/ : <50.0 \*\*  
1000 s: (-)

#### Remarks:

: MAN-NR. 2-7944

\* applies to cylinders 2, 3, 4 and 8  
\*\* applies for cylinders 1, 5, 6, and 7

### APPLICATION

### Ship

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 p

Edition : 29.03.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 648 852

## Injection pump

Pump designation : PE8P120A920/4LS7166

EP type number : 0 412 628 832

## Governor

Governor design. : RQ750PA758-2

Governor no. : 0 421 801 462

## Customer-spec. information

Customer : SAAB-SCANIA

Engine : DS 14

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019Opening  
pressure, bar : 207...210Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
6- 8Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 25.2...25.4

100 s: (24.9...25.7)

Spread cm<sup>3</sup> : 0.7

100 s: (1.0)

## FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 700  
Del.quantity : 252.0...254.0

1000 : (249.0...257.0)

Spread cm<sup>3</sup> : 7.00  
1000 : (10.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 26...34

## Testing:

1st rack travel in: 11.50  
Speed rpm : 750...7552nd rack travel in: 4.00  
Speed rpm : 784...7974th rack travel in: 850  
Speed rpm : 0.00...1.00

## BREAKAWAY

1st version  
1mm rack travel less thanfull load rack tr: 11.50  
Speed rpm : 750...755

## HIGH IDLE

1st version

Rack travel in mm : 5.00...5.20  
Spread cm<sup>3</sup> : 4.00  
1000 s: (7.00)

Remarks:

:

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

#### APPLICATION

Generator

Generator set

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 17,2 e  
 Edition : 29.03.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 854  
  
 Injection pump  
 Pump designation : PE8P130A920/5LS7822  
 EP type number : 0 412 638 802  
 Governor  
 Governor design. : RQV300...950PA905  
 Governor no. : 0 421 813 723  
  
 Customer-spec. information  
 Customer : IVECO-FIAT  
  
 Engine : 8280.42.001

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 40...45  
  
 Overflow valve : 1 417 413 025  
  
 Inlet press., bar : 1.50  
  
 Test nozzle holder assembly : 1 688 901 019  
  
 Opening pressure, bar : 207...210  
  
 Orifice plate diameter mm : 0,8  
  
 Test Lines : 1 688 750 074  
  
 Outside diameter x Wall thickness x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant. per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20  
 : (5.05...5.25)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 4- 3- 6- 5-  
 7- 2

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 550  
 Rack travel in mm : 11.70...11.80  
 Del.quantity cm<sup>3</sup>/ : 22.5...22.8  
 100 s: (22.1...23.1)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.6...5.8  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.3...2.7)  
 Spread cm<sup>3</sup> : 1.0  
 100 s: (1.4)

## (B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**

1st speed	rpm	: 300
	travel mm	: 1.20...1.40
2nd speed	rpm	: 425
	travel mm	: 3.20...3.80
3rd speed	rpm	: 650
	travel mm	: 4.90...5.50
4th speed	rpm	: 950
	travel mm	: 7.90...8.10
5th speed	rpm	: 1200
	travel mm	: 11.00...12.00

**GUIDE SLEEVE POSITION**  
 Control-lever position  
 Degree: -1  
 Speed rpm : 975  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed	rpm	: 550
Aneroid pressure h:	900	
Del.quantity		: 225.0...228.0
1000		: (221.5...231.5)

Spread      cm<sup>3</sup> : 6.00  
1000 : (10.00)

Del.quantity cm<sup>3</sup>/ : 168.0...171.0  
1000 s: (164.5...174.5)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.70  
Speed      rpm : 990...1000

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed      rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...230.0  
1000 s: (196.0...234.0)

#### LOW IDLE 1

Control lever

position degrees: 8...16

Speed      rpm : 300

Rack travel in mm : 5.60...5.80

Del.quantity cm<sup>3</sup>/ : 17.0...23.0

1000 s: (13.0...27.0)

Spread      cm<sup>3</sup> : 10.00

1000 s: (14.00)

#### Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

1st version

Setting

Speed      rpm : 500

Pressure    hPa : 900

Rack travel    mm : 11.70...11.80

Measurement

Speed      1/min : 500

1st pressure hPa : -

Rack travel in m: 9.70...9.90

2nd pressure hPa : 440

Rack travel in m: 11.10...11.20

3rd pressure hPa : 400

Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed      rpm : 950

Del.quantity cm<sup>3</sup>/ : 222.0...229.0

1000 s: (218.5...232.5)

Aneroid pressure h: -

Speed      rpm : 500

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 o  
 Edition : 29.03.89  
 Replaces : 7.2.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 855

Injection pump  
 Pump designation : PE8P120A320LS7823  
 EP type number : 0 412 628 835  
 Governor  
 Governor design. : RQV350..1050PA870-5  
 Governor no. : 0 421 813 735

## Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM442 LA

1st version kW : 353.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 23.4...23.7

100 s: (23.1...24.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.90...2.10  
 2nd speed rpm : 800  
 travel mm : 4.90...5.20  
 3rd speed rpm : 1100  
 travel mm : 7.90...8.30  
 4th speed rpm : 1175  
 travel mm : 9.30...9.90

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
 Aneroid pressure h: 900  
 Del.quantity : 234.0...237.0  
 1000 : (231.0...240.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

#### RATED SPEED

1st version  
 Control lever  
 position degrees: 53...61

Testing:  
 1st rack travel in: 13.40  
 Speed rpm : 1090...1100  
 2nd rack travel in: 4.00  
 Speed rpm : 1170...1200  
 4th rack travel in: 1300  
 Speed rpm : 0.00...1.00

LOW IDLE 1  
 Control lever  
 position degrees: 18...26

Testing:  
 Speed rpm : 250  
 Minimum rack trave: 7.10  
 Speed rpm : 350  
 Rack travel in mm : 5.00...5.60

CONSTANT REGULATION  
 Speed rpm : 350...550

TORQUE CONTROL  
 Dimension a mm : 0.50  
 2nd speed rpm : 1050  
 Rack travel in m: 14.40...14.60  
 3rd speed rpm : 800  
 Rack travel in m: 14.90...15.10

Aneroid/Altitude  
 Compensator Test

1st version  
 Setting  
 Speed rpm : 600  
 Pressure hPa : 900  
 Rack travel mm : 13.60...13.80

Measurement  
 Speed 1/min : 600  
 1st pressure hPa : 350  
 Rack travel in m: 11.10...11.30  
 2nd pressure hPa : 1050  
 Rack travel in m: 13.70...13.90  
 3rd pressure hPa : 1250  
 Rack travel in m: 14.50...14.70

4th pressure hPa : 1400  
 Rack travel in m: 14.80...15.00  
 5th pressure hPa : -  
 Rack travel in m: 9.90...10.20

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
 Aneroid pressure h: 1600  
 Speed rpm : 1050  
 Del.quantity cm<sup>3</sup>/s : 252.0...256.0  
 1000 s: (249.0...259.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: 1600  
 Speed rpm : 800  
 Del.quantity cm<sup>3</sup>/s : 263.0...267.0  
 1000 s: (260.0...270.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: -  
 Speed rpm : 500  
 Del.quantity cm<sup>3</sup>/s : 145.0...147.0  
 1000 s: (142.0...150.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)

#### BREAKAWAY

1st version  
 1mm rack travel less than  
 full load rack tr: 13.40  
 Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/s : 240.0...260.0  
 1000 s: (236.0...264.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 p  
 Edition : 29.03.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 858

Injection pump  
 Pump designation : PE8P120A320LS7816-10  
 EP type number : 0 412 628 836  
 Governor  
 Governor design. : RQ300/1050PA717-2  
 Governer no. : 0 421 801 439

## Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM442 LA

1st version kW : 353.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8-7-2-6-3-5-  
 4-1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 23.4...23.7

100 s: (23.1...24.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 234.0...237.0

1000 : (231.0...240.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.40  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 13.00  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack trave: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 800  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1050  
Rack travel in m: 13.70...13.90 \*  
4th pressure hPa : 1500  
Rack travel in m: 14.80...15.00  
5th pressure hPa : -  
Rack travel in m: 9.90...10.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 252.0...256.0  
1000 s: (249.0...259.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 263.0...267.0  
1000 s: (260.0...270.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a11  
 Edition : 14.04.89  
 Replaces : 3.3.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 859

Injection pump  
 Pump designation : PE8P120A320LS7801-1  
 EP type number : 0 412 628 818  
 Governor  
 Governor design. : RQV350..950PA866-4  
 Governor no. : 0 421 813 737

## Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM442 A

1st version kW : 264.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 930

Rack travel in mm : 13.20...13.30

Del.quantity cm<sup>3</sup>/

100 s: (20.3...21.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.5

Del.quantity cm<sup>3</sup>/

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed	rpm	: 350
travel mm		: 1.40...1.60
2nd speed	rpm	: 425
travel mm		: 2.40...2.60
3rd speed	rpm	: 800
travel mm		: 5.30...5.60
4th speed	rpm	: 1000
travel mm		: 7.80...8.20
5th speed	rpm	: 1100
travel mm		: 9.40...9.90

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1000

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 930  
 Aneroid pressure h: 950  
 Del.quantity : 206.0...208.0  
 1000 : (203.0...211.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

#### RATED SPEED

1st version  
 Control lever  
 position degrees: 51...59

Testing:  
 1st rack travel in: 12.00  
 Speed rpm : 980...990  
 2nd rack travel in: 4.00  
 Speed rpm : 1080...1110  
 4th rack travel in: 1200  
 Speed rpm : 0.00...1.00

LOW IDLE 1  
 Control lever  
 position degrees: 18...26

Testing:  
 Speed rpm : 250  
 Minimum rack trave: 7.60  
 Speed rpm : 350  
 Rack travel in mm : 5.00...5.50

CONSTANT REGULATION  
 Speed rpm : 350...550

TORQUE CONTROL  
 Dimension a mm : 1.70  
 Torque control curve - 1st version  
 1st speed rpm : 950  
 Rack travel in m: 12.90...13.10  
 2nd speed rpm : 800  
 Rack travel in m: 14.60...14.80  
 3rd speed rpm : 900  
 Rack travel in m: 13.40...13.60

#### Aneroid/Altitude Compensator Test

1st version  
 Setting  
 Speed rpm : 600  
 Pressure hPa : -  
 Rack travel mm : 10.90...11.30

Measurement  
 Speed 1/min : 600

1st pressure hPa : 450

Rack travel in m: 11.70...11.90  
 2nd pressure hPa : 700  
 Rack travel in m: 13.80...14.00

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
 Aneroid pressure h: 950  
 Speed rpm : 750  
 Del.quantity cm<sup>3</sup>/ : 229.0...233.0  
 1000 s: (226.0...236.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: 950  
 Speed rpm : 930  
 Del.quantity cm<sup>3</sup>/ : 167.0...169.0 \*  
 1000 s: (164.0...172.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: -  
 Speed rpm : 500  
 Del.quantity cm<sup>3</sup>/ : 143.0...145.0  
 1000 s: (140.0...148.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)

#### BREAKAWAY

1st version  
 1mm rack travel less than  
 full load rack tr: 12.00  
 Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 190.0...210.0  
 1000 s: (186.0...214.0)

#### Remarks:

\* = Set at reduced-delivery stop.

#### APPLICATION

Special-purpose vehicle

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a12  
 Edition : 29.03.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 862

Injection pump  
 Pump designation : PE8P120A320LS7801-3  
 EP type number : 0 412 628 838  
 Governor  
 Governor design. : RQ300/1050PA762-5  
 Governer no. : 0 421 801 399

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 A

1st version kW : 260.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.10...14.30

Del.quantity cm<sup>3</sup>/ : 20.3...20.5

100 s: (20.0...20.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 650

Del.quantity : 203.0...205.0

1000 : (200.0...208.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.80  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.75  
2nd speed rpm : 1050  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 850  
Rack travel in m: 13.70...14.00  
4th speed rpm : 700  
Rack travel in m: 14.40...14.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 400  
Rack travel in m: 13.40...13.70  
3rd pressure hPa : 850  
Rack travel in m: 14.20...14.30 \*  
4th pressure hPa : -  
Rack travel in m: 11.40...11.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1050  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ 1000 s: 180.0...183.0  
1000 s: (177.0...186.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ 1000 s: 215.0...219.0  
1000 s: (212.0...222.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ 1000 s: 206.0...210.0  
1000 s: (203.0...213.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ 1000 s: 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 q  
 Edition : 11.05.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 864

Injection pump  
 Pump designation : PE8P120A320LS7816  
 EP type number : 0 412 628 829  
 Governor  
 Governor design. : RQ300/950PA762-7  
 Governer no. : 0 421 801 480

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 LA

1st version kW : 353.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 23.4...23.7

100 s: (23.1...24.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 2.00...2.40  
 2nd speed rpm : 600  
 travel mm : 5.90...6.10  
 3rd speed rpm : 950  
 travel mm : 6.20...6.50  
 4th speed rpm : 1020  
 travel mm : 6.50...6.90  
 5th speed rpm : 1075  
 travel mm : 9.00...9.50

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

**1st version**

Speed rpm : 600  
 Aneroid pressure h: 900  
 Del.quantity : 234.0...237.0  
 1000 : (231.0...240.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

**RATED SPEED****1st version****Setting point:**

Speed rpm : 600  
 Rack travel in mm : 20.0

**Testing:**

1st rack travel in: 13.70  
 Speed rpm : 995...910  
 2nd rack travel in: 4.00  
 Speed rpm : 1050...1080  
 4th rack travel in: 1300  
 Speed rpm : 0.00...1.50

**LOW IDLE 1**

Setting point w/out bumper spring  
 Speed rpm : 300  
 Rack travel in mm : 6.2

**Testing:**

Speed rpm : 200  
 Minimum rack trave: 7.80  
 Speed rpm : 300  
 Rack travel in mm : 5.90...6.50  
 Rack travel in mm : 2.00  
 Speed rpm : 380...420

**Aneroid/Altitude  
Compensator Test****1st version**

Setting  
 Speed rpm : 600  
 Pressure hPa : 900  
 Rack travel mm : 13.60...13.80

**Measurement**

Speed 1/min : 600

1st pressure hPa : 350  
 Rack travel in m: 11.10...11.30  
 2nd pressure hPa : 650  
 Rack travel in m: 12.80...13.00  
 3rd pressure hPa : 1055  
 Rack travel in m: 16.70...16.90  
 4th pressure hPa : 1500  
 Rack travel in m: 14.80...15.00  
 5th pressure hPa : -

Rack travel in m: 9.90...10.20

**START CUT-OUT**

Speed 1/min : 220 (240)

**FUEL DELIVERY CHARACTERISTICS****1st version**

Aneroid pressure h: 1600  
 Speed rpm : 950  
 Del.quantity cm<sup>3</sup>/ : 261.0...264.0  
 1000 s: (258.0...267.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: 1600  
 Speed rpm : 800  
 Del.quantity cm<sup>3</sup>/ : 263.0...267.0  
 1000 s: (260.0...270.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: -  
 Speed rpm : 500  
 Del.quantity cm<sup>3</sup>/ : 145.0...147.0  
 1000 s: (142.0...150.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)

**BREAKAWAY**

1st version  
 1mm rack travel less than

full load rack tr: 13.70  
 Speed rpm : 995...910

**STARTING FUEL DELIVERY**

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
 1000 s: (236.0...264.0)

Remarks:

:

\* Increase in control-rod travel with  
 respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 21.9 j 1  
 Edition : 07.02.89  
 Replaces : 18.9.87  
 Test oil : ISO-4113

Combination no. : 0 402 670 804

Injection pump  
 Pump designation : PE12P120A320LS7813-1  
 EP type number : 0 412 620 811  
 Governor  
 Governor design. : RSV350...750POA825-5  
 Governor no. : 0 421 833 277

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM 444 LA

1st version kW : 441.0  
 Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 057

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.90...16.00

Del.quantity cm<sup>3</sup>/ : 26.7...26.9

100 s: (26.4...27.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.3

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.40

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700  
 Del.quantity : 267.0...269.0  
 1000 : (264.0...272.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 20...28

Testing:

1st rack travel in: 14.90  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 775...788  
4th rack travel in: 900  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 9...17  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.2  
Speed rpm : 350  
Rack travel in mm : 5.10...5.30

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.10  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

Observe VDT-I-420/120

APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 14,2 C  
 Edition : 05.06.87  
 Replaces : 10.84  
 Test oil : ISO-4113

Combination no. : 0 402 678 800

Injection pump  
 Pump designation : PE8P120A920/4LS7002  
 EP type number : 0 412 628 800  
 Governor  
 Governor design. : RSV350...1100P1/484  
 Governor no. : 0 421 833 122

## Customer-spec. information

Customer : SAAB-SCANIA

Engine : DS14..., DS14..

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.20...13.30

Del.quantity cm<sup>3</sup>/ : 18.7...18.9

100 s: (18.4...19.2)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.4...4.6

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (-)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 6.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 187.0...189.0

1000 : (184.0...192.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 62...70

## Testing:

1st rack travel in: 12.20

Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 27...35  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.0  
Speed rpm : 350  
Rack travel in mm : 3.90...4.10  
Rack travel in mm : 2.00  
Speed rpm : 440...500

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ 1000 s: 184.0...192.0  
1000 s: (182.0...194.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 240.0...290.0  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.40...4.60  
Del.quantity cm<sup>3</sup>/ 1000 s: 10.0...14.0  
Spread cm<sup>3</sup> : 3.00  
1000 s: (6.00)

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm  
Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on August 29, 1983

Start of delivery - engine:  
DS 14 - 18° before TDC  
DSI 14 - 17° before TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

Navy

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a13  
 Edition : 30.03.87  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 678 804

Injection pump  
 Pump designation : PE8P120A320LS7801-1  
 EP type number : 0 412 628 818  
 Governor  
 Governor design. : RSV350...1050P0A825-4  
 Governor no. : 0 421 833 261

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442A

1st version kW : 255.0  
 Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (4.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.70...15.80

Del.quantity cm<sup>3</sup>/ : 24.1...24.3

100 s: (23.8...24.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700  
 Del.quantity : 241.0...243.0  
 1000 : (238.0...246.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 74...82

Testing:

1st rack travel in: 14.70  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 1135...1150  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 60...68  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 350...410

SET IDLE AUXILIARY SPRING

Speed rpm : 2.00

TORQUE CONTROL

2nd speed rpm : 900  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 1000  
Rack travel in m: 12.40...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 246.0...252.0  
1000 s: (243.0...255.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 250.0...270.0  
1000 s: (246.0...274.0)

Remarks:

:

APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 g 5  
 Edition : 21.04.89  
 Replaces : 9.9.88  
 Test oil : ISO-4113

Combination no. : 0 402 678 810

Injection pump  
 Pump designation : PE8P120A320LS7801-2  
 EP type number : 0 412 628 825  
 Governor  
 Governor design. : RSV450...1050P0A541  
 Governer no. : 0 421 833 303

## Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM442A

1st version kW : 260.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (4.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/

100 s: (17.8...18.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 450.0

Rack travel in mm : 4.9...5.2

Del.quantity cm<sup>3</sup>/

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 1100

Del.quantity : 181.0...183.0

1000 : (178.0...186.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 38...46

Testing:

1st rack travel in: 11.70  
Speed rpm : 1060...1070  
2nd rack travel in: 4.00  
Speed rpm : 1110...1130  
4th rack travel in: 14.00  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 450  
Rack travel in mm : 4.90...5.20  
Rack travel in mm : 2.00  
Speed rpm : 460...520

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 950  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 800  
Rack travel in m: 13.80...14.00  
4th speed rpm : 700  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.00...11.30

Measurement

Speed 1/min : 500

1st pressure hPa : 420  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 600  
Rack travel in m: 13.40...13.60

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ 1000 s: 213.0...217.0  
cm<sup>3</sup> : (210.0...220.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ 1000 s: 143.0...145.0  
cm<sup>3</sup> : (140.0...148.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1060...1070

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 180.0...200.0  
cm<sup>3</sup> : (176.0...204.0)

Remarks: :

APPLICATION

Forage harvester

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 r  
 Edition : 29.03.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 678 812

Injection pump  
 Pump designation : PE8P120A320LS7801-2  
 EP type number : 0 412 628 825  
 Governor  
 Governor design. : RSV350...1050P0A535-  
 2  
 Governor no. : 0 421 833 318

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442A

1st version kW : 260.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (4.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 1100

Del.quantity : 181.0...183.0

1000 : (178.0...186.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 36...44

Testing:

1st rack travel in: 11.70  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 14.00  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.2

Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.10...5.40  
Rack travel in mm : 2.00  
Speed rpm : 410...480

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 950  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 830  
Rack travel in m: 13.80...14.00  
4th speed rpm : 700  
Rack travel in m: 14.40...14.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.20...11.50

Measurement  
Speed 1/min : 500

1st pressure hPa : 420  
Rack travel in m: 11.90...12.10  
2nd pressure hPa : 600  
Rack travel in m: 13.60...13.80

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ 1000 s: 213.0...217.0  
1000 s: (210.0...220.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ 1000 s: 143.0...145.0  
1000 s: (140.0...148.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 180.0...200.0  
1000 s: (176.0...204.0)

Remarks:

:  
Observe VDT-I-420/120

APPLICATION

Snow plough

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 10,0 m  
 Edition : 14.04.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 745 805

Injection pump  
 Pump designation : PES5P120A720LS7160  
 EP type number : 0 412 725 802  
 Governor  
 Governor design. : RQ300/1050PA774-2  
 Governer no. : 0 421 801 450

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM449 A

1st version kW : 184.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.10...13.30

Del.quantity cm<sup>3</sup>/ : 19.6...19.8

100 s: (19.3...20.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.3

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 650

Del.quantity : 196.0...198.0

1000 : (193.0...201.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

**Testing:**

1st rack travel in: 12.60  
 Speed rpm : 1095...1110  
 2nd rack travel in: 4.00  
 Speed rpm : 1160...1190  
 4th rack travel in: 1300  
 Speed rpm : 0.00...1.50

**LOW IDLE 1**

Setting point w/out bumper spring  
 Speed rpm : 300  
 Rack travel in mm : 6.0

**Testing:**

Speed rpm : 200  
 Minimum rack travel: 7.90  
 Speed rpm : 300  
 Rack travel in mm : 5.70...6.30  
 Rack travel in mm : 2.00  
 Speed rpm : 365...405

**TORQUE CONTROL**

Dimension a mm : ?  
 Torque control curve - 1st version  
 1st speed rpm : 1050  
 Rack travel in m: 13.60...13.80  
 2nd speed rpm : 750  
 Rack travel in m: 14.00...14.20

**Aneroid/Altitude  
Compensator Test****1st version**

Setting  
 Speed rpm : 600  
 Pressure hPa : 650  
 Rack travel mm : 13.10...13.30

**Measurement**

Speed 1/min : 600

1st pressure hPa : 250  
 Rack travel in m: 11.20...11.40  
 2nd pressure hPa : 400  
 Rack travel in m: 12.50...12.70  
 3rd pressure hPa : 750  
 Rack travel in m: 13.20...13.30 \*  
 4th pressure hPa : 850  
 Rack travel in m: 13.60...13.80  
 5th pressure hPa : -  
 Rack travel in m: 10.80...11.10

**START CUT-OUT**

Speed 1/min : 220 (240)

**FUEL DELIVERY CHARACTERISTICS****1st version**

Aneroid pressure h: 1200  
 Speed rpm : 1050  
 Del.quantity cm<sup>3</sup>/ : 208.0...211.0  
 1000 s: (205.0...214.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: 1200  
 Speed rpm : 750  
 Del.quantity cm<sup>3</sup>/ : 216.0...220.0  
 1000 s: (213.0...223.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: -  
 Speed rpm : 500  
 Del.quantity cm<sup>3</sup>/ : 150.0...152.0  
 1000 s: (147.0...155.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)

**BREAKAWAY**

1st version  
 1mm rack travel less than  
 full load rack tr: 12.60  
 Speed rpm : 1095...1110

**STARTING FUEL DELIVERY**

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
 1000 s: (216.0...244.0)

**Remarks:**

\* Increase in control-rod travel with  
 respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MBN 10,0 °  
 Edition : 29.03.89  
 Replaces : 3.3.89  
 Test oil : ISO-4113

Combination no. : 0 402 745 806

Injection pump  
 Pump designation : PES5P120A720LS7163  
 EP type number : 0 412 725 803  
 Governor  
 Governor design. : RQ300/1050PA774-4  
 Governor no. : 0 421 801 453

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM449 LA

1st version kW : 221.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm3/ : 23.5...23.7

100 s: (23.2...24.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...5.9

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 235.0...237.0

1000 : (232.0...240.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

#### Testing:

1st rack travel in: 12.00  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 13.00  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 200  
Minimum rack trave: 7.60  
Speed rpm : 300  
Rack travel in mm : 5.60...5.90  
Rack travel in mm : 2.00  
Speed rpm : 370...410

#### TORQUE CONTROL

Dimension a mm : 0.65  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.00...13.20  
2nd speed rpm : 750  
Rack travel in m: 14.40...14.60

#### Aneroid/Altitude

##### Compensator Test

##### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.60...13.80

##### Measurement

Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 450  
Rack travel in m: 13.00...13.20  
3rd pressure hPa : 1000  
Rack travel in m: 13.70...13.80 \*  
4th pressure hPa : 1125  
Rack travel in m: 14.10...14.30  
5th pressure hPa : -  
Rack travel in m: 10.00...10.40

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1400  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ 1000 s: 228.0...231.0  
1000 s: (225.0...234.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ 1000 s: 250.0...254.0  
1000 s: (247.0...257.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ 1000 s: 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 220.0...240.0  
1000 s: (216.0...244.0)

#### Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 10,0 r  
 Edition : 08.05.89  
 Replaces : -  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 745 807  
  
 Injection pump  
 Pump designation : PES5P120A720LS7174  
 EP type number : 0 412 725 806  
 Governor  
 Governor design. : RQ300/1050PA774-2  
 Governer no. : 0 421 801 450  
  
 Customer-spec. information  
 Customer : DAIMLER-BENZ  
  
 Engine : OM449 A  
  
 1st version kW : 184.0  
 Rated speed : 2100  
  
**TEST BENCH REQUIREMENTS**  
  
 Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve : 1 417 413 025  
  
 Inlet press., bar : 1.50  
  
 Overflow  
 quantity min. 1/h: 100...120  
  
 Test nozzle holder  
 assembly : 1 688 901 019  
  
 Opening  
 pressure, bar : 207...210  
  
 Orifice plate  
 diameter mm : 0,8  
  
 Test Lines : 1 680 750 067  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000  
  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.10...13.30

Del.quantity cm<sup>3</sup>/

100 s: (19.3...20.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.3

Del.quantity cm<sup>3</sup>/

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 650

Del.quantity : 196.0...198.0

1000 : (193.0...201.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

### Testing:

1st rack travel in: 12.60  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 13.00  
Speed rpm : 0.00...1.50

### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0

### Testing:

Speed rpm : 200  
Minimum rack travel: 7.90  
Speed rpm : 300  
Rack travel in mm : 5.70...6.30  
Rack travel in mm : 2.00  
Speed rpm : 365...405

### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.60...13.80  
2nd speed rpm : 750  
Rack travel in m: 14.00...14.20

### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 13.10...13.30

#### Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 400  
Rack travel in m: 12.50...12.70  
3rd pressure hPa : 750  
Rack travel in m: 13.20...13.30 \*  
4th pressure hPa : 850  
Rack travel in m: 13.60...13.80  
5th pressure hPa : -  
Rack travel in m: 10.80...11.10

### START CUT-OUT

Speed 1/min : 220 (240)

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ 1000 s: 208.0...211.0  
1000 s: (205.0...214.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ 1000 s: 216.0...220.0  
1000 s: (213.0...223.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ 1000 s: 150.0...152.0  
1000 s: (147.0...155.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 1095...1110

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 220.0...240.0  
1000 s: (216.0...244.0)

#### Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 10,0 s  
 Edition : 08.05.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 745 808

Injection pump  
 Pump designation : PES5P120A720LS7163  
 EP type number : 0 412 725 807  
 Governor  
 Governor design. : RQ300/1050PA774-4  
 Governor no. : 0 421 801 453

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM449 LA

1st version kW : 221.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 23.5...23.7

100 s: (23.2...24.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...5.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 235.0...237.0

1000 : (232.0...240.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

#### Testing:

1st rack travel in: 12.00  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 200  
Minimum rack trave: 7.60  
Speed rpm : 300  
Rack travel in mm : 5.60...5.90  
Rack travel in mm : 2.00  
Speed rpm : 370...410

#### TORQUE CONTROL

Dimension a mm : 0.65  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.00...13.20  
2nd speed rpm : 750  
Rack travel in m: 14.40...14.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.60...13.80

#### Measurement

Speed 1/min : 600  
  
1st pressure hPa : 200  
Rack travel in m: 10.00...11.20  
2nd pressure hPa : 450  
Rack travel in m: 134.00...13.20  
3rd pressure hPa : 1000  
Rack travel in m: 13.70...13.80 \*  
4th pressure hPa : 1125  
Rack travel in m: 14.10...14.30  
5th pressure hPa : -  
Rack travel in m: 10.00...10.40

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1400  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ 1000 s: 228.0...231.0  
cm<sup>3</sup> : (225.0...234.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ 1000 s: 250.0...254.0  
cm<sup>3</sup> : (247.0...257.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ 1000 s: 146.0...148.0  
cm<sup>3</sup> : (143.0...151.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 220.0...240.0  
cm<sup>3</sup> : (216.0...244.0)

#### Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MAC 11.1 a4  
 Edition : 29.03.89  
 Replaces : 7.2.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 817

Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA848-4K  
 Governor no. : 0 421 815 173

### Customer-spec. information

Customer : MACK

Engine : EC6-350 4VH

1st version kW : 261.0  
 Rated speed : 1800

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.20...15.30

Del.quantity cm<sup>3</sup>/ : 25.0...25.2

100 s: (24.7...25.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del.quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

### (B) Setting of injection pump with governor

#### GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 3.10...3.30  
 3rd speed rpm : 850  
 travel mm : 5.90...6.10  
 4th speed rpm : 1000  
 travel mm : 7.50...7.70

#### GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 7.00...13.00

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 900  
 Aneroid pressure h: 1200  
 Del.quantity : 250.5...252.5  
 1000 : (247.5...255.5)

Spread      cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 56...64

##### Testing:

1st rack travel in: 14.20  
Speed      rpm : 950...960  
2nd rack travel in: 4.00  
Speed      rpm : 1090...1120  
4th rack travel in: 1200  
Speed      rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 7...15

##### Testing:

Speed      rpm : 275  
Minimum rack trave: 6.40  
Speed      rpm : 325  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed      rpm : 325...520

#### TORQUE CONTROL

##### Torque control curve - 1st version

1st speed      rpm : 900  
Rack travel in m: 15.20...15.30  
2nd speed      rpm : 625  
Rack travel in m: 15.50...15.60  
3rd speed      rpm : 700  
Rack travel in m: 15.40...15.60  
4th speed      rpm : 500  
Rack travel in m: <15.00

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed      rpm : 625  
Pressure      hPa : 1200  
Rack travel      mm : 15.50...15.60

##### Measurement

Speed      1/min : 625

1st pressure hPa : -

Rack travel in m: 8.30...8.70

2nd pressure hPa : 280

Rack travel in m: 10.40...10.50

3rd pressure hPa : 650

Rack travel in m: 13.30...13.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed      rpm : 625  
Del.quantity cm<sup>3</sup>/ : 278.0...284.0  
1000 s: (275.0...287.0)

Spread      cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: -  
Speed      rpm : 400  
Del.quantity cm<sup>3</sup>/ : 130.5...134.5  
1000 s: (128.5...136.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 14.20  
Speed      rpm : 950...960

#### STARTING FUEL DELIVERY

Speed      rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...160.0  
1000 s: (110.0...170.0)

Rack travel in mm : 8.30...8.70

#### LOW IDLE

Speed      rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)

Spread      cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11.1 b6  
 Edition : 29.03.89  
 Replaces : 7.2.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 825

Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA878-5K  
 Governer no. : 0 421 815 182

## Customer-spec. information

Customer : MACK

Engine : EC6-350 4VH

1st version kW : 261.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.20...15.30

Del.quantity cm<sup>3</sup>/ : 25.0...25.2

100 s: (24.7...25.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del.quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 3.10...3.30

3rd speed rpm : 850

travel mm : 5.90...6.10

4th speed rpm : 1000

travel mm : 7.50...7.70

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 250.5...252.5

1000 : (247.5...255.5)

Spread      cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 56...64

##### Testing:

1st rack travel in: 14.20  
Speed      rpm : 950...960  
2nd rack travel in: 4.00  
Speed      rpm : 1090...1120  
4th rack travel in: 1200  
Speed      rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 7...15

##### Testing:

Speed      rpm : 275  
Minimum rack trave: 6.40  
Speed      rpm : 325  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed      rpm : 325...520

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed      rpm : 900  
Rack travel in m: 15.20...15.30  
2nd speed      rpm : 625  
Rack travel in m: 15.50...15.60  
3rd speed      rpm : 700  
Rack travel in m: 15.40...15.60  
4th speed      rpm : 500  
Rack travel in m: <15.00

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed      rpm : 625  
Pressure      hPa : 1200  
Rack travel      mm : 15.50...15.60

##### Measurement

Speed      1/min : 625

##### 1st pressure hPa : -

Rack travel in m: 8.30...8.70  
2nd pressure hPa : 280  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 650  
Rack travel in m: 13.30...13.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed      rpm : 625  
Del.quantity cm<sup>3</sup>/ : 278.0...284.0  
1000 s: (275.0...287.0)

Spread      cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: -  
Speed      rpm : 400  
Del.quantity cm<sup>3</sup>/ : 130.5...134.5  
1000 s: (128.5...136.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.20  
Speed      rpm : 950...960

#### STARTING FUEL DELIVERY

Speed      rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...160.0  
1000 s: (110.0...170.0)

Rack travel in mm : 8.30...8.70

#### LOW IDLE

Speed      rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread      cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 f 1  
 Edition : 29.03.89  
 Replaces : 7.3.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 830

Injection pump  
 Pump designation : PES6P120A720LS7107  
 EP type number : 0 412 726 801  
 Governor  
 Governor design. : RQV350..1100PA886  
 Governer no. : 0 421 813 691

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM447ha

1st version kW : 206.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 13.40...13.50

Del.quantity cm<sup>3</sup>/ : 19.7...19.9

100 s: (19.4...20.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.5

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 2.20...2.40

2nd speed rpm : 580

travel mm : 3.80...4.20

3rd speed rpm : 1150

travel mm : 8.00...8.50

4th speed rpm : 1230

travel mm : 9.20...9.80

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1160

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Aneroid pressure h: 750  
Del.quantity : 197.0...199.0  
1000 : (194.0...202.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 60...68

#### Testing:

1st rack travel in: 12.40  
Speed rpm : 1120...1130  
2nd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

#### Testing:

Speed rpm : 250  
Minimum rack trave: 7.50  
Speed rpm : 350  
Rack travel in mm : 5.20...5.50

#### CONSTANT REGULATION

Speed rpm : 350...550

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.70...11.00

Measurement  
Speed 1/min : 500

1st pressure hPa : 230  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 370  
Rack travel in m: 12.40...12.60

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 750

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/s : 196.0...200.0  
1000 s: (193.0...203.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 750  
Speed rpm : 1080  
Del.quantity cm<sup>3</sup>/s : 150.0...152.0 \*  
1000 s: (147.0...155.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/s : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1120...1130

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/s : 150.0...170.0  
1000 s: (146.0...174.0)

#### Remarks:

\* = Set at reduced delivery stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 12,0 a 2  
 Edition : 29.03.89  
 Replaces : 3.3.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 841

Injection pump  
 Pump designation : PES6P120A720LS7114-2  
 EP type number : 0 412 726 815  
 Governor  
 Governor design. : RQ300/1050PA774-3  
 Governer no. : 0 421 801 451

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM447 LA

1st version kW : 265.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.00...14.20

Del.quantity cm<sup>3</sup>/ : 22.9...23.1

100 s: (22.6...23.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.8...6.2

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 229.0...231.0

1000 : (226.0...234.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

**Testing:**

1st rack travel in: 13.20  
 Speed rpm : 1095...1110  
 2nd rack travel in: 4.00  
 Speed rpm : 1150...1180  
 4th rack travel in: 1300  
 Speed rpm : 0.00...1.50

**LOW IDLE 1**

Setting point w/out bumper spring  
 Speed rpm : 300  
 Rack travel in mm : 6.0  
 Speed rpm : 300  
 Rack travel in mm : 5.80...6.20  
 Rack travel in mm : 2.00  
 Speed rpm : 360...400

**TORQUE CONTROL**

Dimension a mm : ?  
 2nd speed rpm : 1050  
 Rack travel in m: 14.20...14.40  
 3rd speed rpm : 700  
 Rack travel in m: 14.70...14.90

**Aneroid/Altitude  
Compensator Test**

1st version  
 Setting  
 Speed rpm : 600  
 Pressure hPa : 700  
 Rack travel mm : 14.70...14.90

Measurement  
 Speed 1/min : 600

1st pressure hPa : 300  
 Rack travel in m: 12.50...12.70  
 2nd pressure hPa : 500  
 Rack travel in m: 14.10...14.30  
 3rd pressure hPa : 1100  
 Rack travel in m: 14.90...15.10 \*  
 4th pressure hPa : 1200  
 Rack travel in m: 15.20...15.40  
 5th pressure hPa : -  
 Rack travel in m: 10.40...10.70

**START CUT-OUT**

Speed 1/min : 220 (240)

**FUEL DELIVERY CHARACTERISTICS**

1st version  
 Aneroid pressure h: 1500  
 Speed rpm : 1050

Del.quantity cm<sup>3</sup>/ 1000 s: 234.0...238.0  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (231.0...341.0)  
 Aneroid pressure h: 1500  
 Speed rpm : 700  
 Del.quantity cm<sup>3</sup>/ 1000 s: 246.0...249.0  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (243.0...252.0)  
 Aneroid pressure h: -  
 Speed rpm : 500  
 Del.quantity cm<sup>3</sup>/ 1000 s: 146.0...148.0  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (143.0...151.0)

**BREAKAWAY**

1st version  
 1mm rack travel less than  
 full load rack tr: 13.20  
 Speed rpm : 1095...1110

**STARTING FUEL DELIVERY**

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ 1000 s: 240.0...260.0  
 1000 s: (236.0...264.0)

**Remarks:**

\* Increase in control-rod travel with  
 respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1a15

Edition : 07.04.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 746 846

## Injection pump

Pump designation : PES6P120A720RS7135

EP type number : 0 412 726 807

Governor

Governor design. : RQV325...850PA848-23  
K

Governer no. : 0 421 815 204

## Customer-spec. information

Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kW : 224.0

Rated speed : 1700

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
(2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.0...202.0  
1000 : (197.0...205.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 50...58

#### Testing:

1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 7...15

#### Testing:

Speed rpm : 275  
Minimum rack trave: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.60...13.70  
3rd speed rpm : 600  
Rack travel in m: 13.80...13.90  
4th speed rpm : 500  
Rack travel in m: 0.00...13.60

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 250

Rack travel in m: 11.20...11.30  
3rd pressure hPa : 475  
Rack travel in m: 12.90...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/s : 237.0...243.0  
1000 s: (234.0...246.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/s : 154.0...158.0  
1000 s: (152.0...160.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 900...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/s : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 10.30...10.50

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/s : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11, 1a16

Edition : 07.04.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 746 847

## Injection pump

Pump designation : PES6P120A720RS7135

EP type number : 0 412 726 807

## Governor

Governor design. : RQV325...850PA878-8K

Governer no. : 0 421 815 205

## Customer-spec. information

Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kW : 224.0

Rated speed : 1700

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 2 417 413 011

Inlet press., bar : 1.50

### Test nozzle holder

assembly : 1 688 901 101

### Opening

pressure, bar : 207...210

### Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 008

### Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

## (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.8

100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.0...202.0

1000 : (197.0...205.0)

Spread      cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 50...58

Testing:  
1st rack travel in: 11.90  
Speed      rpm : 900...910  
2nd rack travel in: 4.00  
Speed      rpm : 1025...1055  
4th rack travel in: 1100  
Speed      rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed      rpm : 275  
Minimum rack travel: 6.00  
Speed      rpm : 325  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00

CONSTANT REGULATION  
Speed      rpm : 325...520

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed      rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed      rpm : 700  
Rack travel in m: 13.60...13.70  
3rd speed      rpm : 600  
Rack travel in m: 13.80...13.90  
4th speed      rpm : 500  
Rack travel in m: 0.00...13.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed      rpm : 600  
Pressure      hPa : 900  
Rack travel      mm : 13.80...13.90

Measurement  
Speed      1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 250  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 475

Rack travel in m: 12.90...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed      rpm : 600  
Del.quantity cm<sup>3</sup>/ : 237.0...243.0  
1000 s: (234.0...246.0)  
Spread      cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed      rpm : 400  
Del.quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed      rpm : 900...910

#### STARTING FUEL DELIVERY

Speed      rpm : 100  
Del.quantity cm<sup>3</sup>/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 10.30...10.50

#### LOW IDLE

Speed      rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread      cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:  
Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1a17

Edition : 07.04.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 746 849

## Injection pump

Pump designation : PES6P120A720RS7135

EP type number : 0 412 726 807

## Governor

Governor design. : RQV325...850PA878-10

K

Governor no. : 0 421 815 209

## Customer-spec. information

Customer : MACK TRUCKS

Engine : E6 275 4VH

1st version kW : 202.0

Rated speed : 1800

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
(2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.90...12.00

Del.quantity cm<sup>3</sup>/ : 18.3...18.5

100 s: (18.0...18.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 183.0...185.0  
1000 : (180.0...188.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 50...58

#### Testing:

1st rack travel in: 10.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 7...15

#### Testing:

Speed rpm : 275  
Minimum rack trave: 6.40  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 11.90...12.90  
2nd speed rpm : 700  
Rack travel in m: 12.80...12.90  
3rd speed rpm : 600  
Rack travel in m: 13.00...13.10  
4th speed rpm : 500  
Rack travel in m: 0.00...12.80

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.00...13.10

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 225  
Rack travel in m: 11.00...11.10

3rd pressure hPa : 385  
Rack travel in m: 12.20...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 219.5...225.5  
1000 s: (216.5...228.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.90  
Speed rpm : 900...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 10.30...10.50

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1a13

Edition : 02.05.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 746 851

## Injection pump

Pump designation : PES6P120A720RS7135

EP type number : 0 412 726 807

## Governor

Governor design. : RQV325...850PA848-25

K

Governor no. : 0 421 815 208

## Customer-spec. information

Customer : MACK TRUCKS

Engine : E6 275 4VH

1st version kW : 202.0

Rated speed : 1800

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
(2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.90...12.00

Del.quantity cm<sup>3</sup>/ : 18.3...18.5

100 s: (18.0...18.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 183.0...185.0  
1000 : (180.0...188.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 50...58

#### Testing:

1st rack travel in: 10.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 7...15

#### Testing:

Speed rpm : 275  
Minimum rack trave: 6.40  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 11.90...12.00  
2nd speed rpm : 700  
Rack travel in m: 12.80...12.90  
3rd speed rpm : 600  
Rack travel in m: 13.00...13.10  
4th speed rpm : 500  
Rack travel in m: 0.00...12.80

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.00...13.10

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 225  
Rack travel in m: 11.00...11.10

3rd pressure hPa : 385  
Rack travel in m: 12.20...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/s : 219.5...225.5  
1000 s: (216.5...228.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/s : 154.0...158.0  
1000 s: (152.0...160.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.90  
Speed rpm : 900...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/s : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 10.30...10.50

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/s : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11.1a14

Edition : 02.05.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 746 852

## Injection pump

Pump designation : PES6P120A720RS7157

EP type number : 0 412 726 814

Governor

Governor design. : RQV325...900PA909K

Governor no. : 0 421 815 210

## Customer-spec. information

Customer : MACK TRUCKS

Engine : E7-400

1st version kW : 298.0

Rated speed : 1700

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.80...15.90

Del.quantity cm<sup>3</sup>/ : 27.5...27.7

100 s: (27.2...28.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 650

travel mm : 5.60...5.80

4th speed rpm : 900

travel mm : 8.30...8.50

5th speed rpm : 1100

travel mm : 10.30...10.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 275.0...277.0

1000 : (272.0...280.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 58...66

#### Testing:

1st rack travel in: 14.80  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1120...1150  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever

position degrees: 7...15

#### Testing:

Speed rpm : 275  
Minimum rack trave: 6.30  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

## CONSTANT REGULATION

Speed rpm : 325...520

## TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 900  
Rack travel in m: 15.80...15.90  
2nd speed rpm : 625  
Rack travel in m: 15.20...15.30  
3rd speed rpm : 700  
Rack travel in m: 15.50...15.60  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

## Aneroid/Altitude

Compensator Test

### 1st version

Setting

Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 15.80...15.90

## Measurement

Speed 1/min : 900

1st pressure hPa : -

Rack travel in m: 8.10...8.50

2nd pressure hPa : 325

Rack travel in m: 10.20...10.30

3rd pressure hPa : 790

Rack travel in m: 13.80...14.20

## START CUT-OUT

Speed 1/min : 275 (285)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm3/ 1000 s: 302.5...308.5  
(299.5...311.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ 1000 s: 157.5...161.5  
(155.5...163.5)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 14.80  
Speed rpm : 940...950

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ 1000 s: 180.0...220.0  
(170.0...230.0)  
Rack travel in mm : 10.40...10.60

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ 1000 s: 40.0...46.0  
(38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

## Remarks:

:  
Delivery-valve spring pre-tension  
3.0...3.2 mm.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 12,0 d 1  
 Edition : 08.05.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 746 855

Injection pump  
 Pump designation : PES6P120A720LS7161  
 EP type number : 0 412 726 817  
 Governor  
 Governor design. : RQ300/1050PA897  
 Governor no. : 0 421 801 452

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM447 A

1st version kW : 213.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del.quantity cm<sup>3</sup>/ : 20.1...20.3

100 s: (19.8...20.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.8...6.2

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.6

100 s: (1.2)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 680

Del.quantity : 201.0...203.0

1000 : (198.0...206.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 20.0

#### Testing:

1st rack travel in: 12.60  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.9

#### Testing:

Speed rpm : 200  
Minimum rack trav: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 680  
Rack travel mm : 14.10...14.30

##### Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 400  
Rack travel in m: 13.20...13.40  
3rd pressure hPa : 800  
Rack travel in m: 14.20...14.30  
4th pressure hPa : -  
Rack travel in m: 11.50...11.80

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 193.0...195.0  
1000 s: (190.0...198.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750

Del.quantity cm3/ : 218.0...222.0  
1000 s: (215.0...225.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...170.0  
1000 s: (146.0...174.0)

#### Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 9,5 a  
 Edition : 08.05.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 746 857

Injection pump  
 Pump designation : PES6P120A720RS7177  
 EP type number : 0 412 726 823  
 Governor  
 Governor design. : RQ285/1100PA915  
 Governer no. : 0 421 801 478

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8460.41.601

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 18.8...19.0

100 s: (18.5...19.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 285.0

Rack travel in mm : 4.2...4.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 188.0...190.0

1000 : (185.0...193.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.30

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1230...1260

4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 285  
Rack travel in mm : 4.3

Testing:  
Speed rpm : 100  
Minimum rack trave: 5.80  
Speed rpm : 285  
Rack travel in mm : 4.20...4.40

CONSTANT REGULATION  
Speed rpm : 330...370

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 600  
Rack travel in m: 11.30...11.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.30...11.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.70...8.80  
2nd pressure hPa : 320  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 270  
Rack travel in m: 9.50...9.70

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 123.0...125.0  
1000 s: (120.0...128.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.30  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:  
:

APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 10,0 q  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 775 801

Injection pump  
 Pump designation : PES5P120A720LS7172  
 EP type number : 0 412 725 805  
 Governor  
 Governor design. : RSV350...1050POA529  
 -2  
 Governer no. : 0 421 833 312

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM449 LA

1st version kW : 221.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27  
 Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 22.9...23.2

100 s: (22.6...23.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.5...4.8

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 1500

Del.quantity : 229.0...232.0

1000 : (226.0...235.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 50...58

Testing:

1st rack travel in: 11.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.65  
Speed rpm : 350  
Rack travel in mm : 4.50...4.80

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 750  
Rack travel in m: 13.90...14.00  
3rd speed rpm : 875  
Rack travel in m: 13.50...13.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 750  
Rack travel mm : 13.10...13.30

Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 10.50...10.70  
2nd pressure hPa : 500  
Rack travel in m: 12.20...12.40  
3rd pressure hPa : 1050  
Rack travel in m: 13.30...13.50  
4th pressure hPa : 1500  
Rack travel in m: 13.90...14.10  
5th pressure hPa : -  
Rack travel in m: 9.50...9.90

FUEL DELIVERY CHARACTERISTICS

1st version

E21

Aneroid pressure h: 750  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ 1000 s: 235.0...238.0  
Spread cm<sup>3</sup> : 8.00  
1000 s: (232.0...241.0)  
Aneroid pressure h: 1500  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ 1000 s: 251.0...254.0  
Spread cm<sup>3</sup> : 8.00  
1000 s: (248.0...257.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ 1000 s: 146.0...148.0  
Spread cm<sup>3</sup> : 8.00  
1000 s: (143.0...151.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 g  
 Edition : 29.03.89  
 Replaces : 12.9.86  
 Test oil : ISO-4113

Combination no. : 0 402 776 801

Injection pump  
 Pump designation : PES6P120A720LS7107-1  
 EP type number : 0 412 726 805  
 Governor  
 Governor design. : RSV350..0750POA520  
 Governor no. : 0 421 833 223

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM427 A

1st version kW : 184.0  
 Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.40...13.50

Del.quantity cm<sup>3</sup>/ : 20.1...20.3

100 s: (19.8...20.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 201.0...203.0

1000 : (198.0...206.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 23...31

Testing:

1st rack travel in: 12.40

Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 775...788  
4th rack travel in: 1000  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 12...20  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 188.0...194.0  
1000 s: (185.0...197.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
Speed rpm : 1130...1140

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 170.0...190.0  
1000 s: (166.0...194.0)

Remarks:

:

Observe VDT-I-420/120

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 c 3  
 Edition : 29.03.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 776 806

Injection pump  
 Pump designation : PES6P120A720LS7120  
 EP type number : 0 412 726 803  
 Governor  
 Governor design. : RSV350..1050P0A529-3  
 Governor no. : 0 421 833 317

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM447 A

1st version kW : 213.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 650

Rack travel in mm : 14.00...14.20

Del.quantity cm<sup>3</sup>/

100 s: (19.9...20.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650

Aneroid pressure h: 650

Del.quantity : 202.0...204.0

1000 : (199.0...207.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 48...56

Testing:

1st rack travel in: 12.20  
Speed rpm : 1080...1090  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 950  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 875  
Rack travel in m: 14.20...14.40  
4th speed rpm : 750  
Rack travel in m: 14.70...14.90

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 600  
Rack travel mm : 14.70...14.90

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 13.00...13.20  
2nd pressure hPa : 400  
Rack travel in m: 13.90...14.10  
3rd pressure hPa : 850  
Rack travel in m: 15.00...15.20  
4th pressure hPa : -  
Rack travel in m: 11.40...11.70

FUEL DELIVERY CHARACTERISTICS

1st version

E25

Aneroid pressure h: 1200  
Speed rpm : 1030  
Del.quantity cm<sup>3</sup>/ : 194.0...197.0  
1000 s: (191.0...200.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 219.0...224.0  
1000 s: (216.0...227.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 1080...1090

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...210.0  
1000 s: (186.0...214.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 D13  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 436 102CA

Injection pump  
 Pump designation : PES6MW100/120RS1143  
 EP type number : 0 413 406 137  
 Governor  
 Governor design. : RQV350...1100MW78-2  
 Governer no. : 0 420 083 160

Cust. part no. : 3908567

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA-8.3  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15  
 : (3.00...3.20)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 15.0...15.2  
 100 s: (14.8...15.4)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 7.3...7.5  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed	rpm	: 1240
travel mm		: 8.80...9.20
2nd speed	rpm	: 1140
travel mm		: 7.80...8.00
3rd speed	rpm	: 700
travel mm		: 3.80...4.40
4th speed	rpm	: 350
travel mm		: 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 900  
 Del.quantity : 150.0...152.0  
 1000 : (148.0...154.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 44...52

Testing:

1st rack travel in: 11.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1330  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.4

Testing:

Speed rpm : 100  
Minimum rack trave: 9.00  
Speed rpm : 350  
Rack travel in mm : 7.30...7.50

CONSTANT REGULATION

Speed rpm : 360...550

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.70...12.80

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.60...9.70  
2nd pressure hPa : 230  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 490  
Rack travel in m: 12.00...12.40

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 76.0...78.0  
1000 s: (74.0...80.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 205.0...225.0  
1000 s: (202.0...228.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark/lock = 8.0°  
angular displacement of the cam after  
start of delivery of cylinder 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 D 6  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 436 103EA

Injection pump  
 Pump designation : PES6MW100/120RS1143  
 EP type number : 0 413 406 137  
 Governor  
 Governor design. : RQV350...1100MW82  
 Governer no. : 0 420 083 130

Cust. part no. : 3915168

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA-830

1st version kW : 186.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.05...3.15  
 : (3.00...3.20)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 15.0...15.2

100 s: (14.8...15.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.2...7.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.4...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1150

travel mm : 8.20...8.40

2nd speed rpm : 1250

travel mm : 9.30...9.70

3rd speed rpm : 350

travel mm : 1.70...2.10

4th speed rpm : 700

travel mm : 4.10...4.70

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 150.0...152.0

1000 : (148.0...154.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 43...51

Testing:

1st rack travel in: 11.70  
Speed rpm : 1150...1160  
2nd rack travel in: 4.00  
Speed rpm : 1245...1275  
4th rack travel in: 1330  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.3

Testing:

Speed rpm : 100  
Minimum rack trave: 9.30  
Speed rpm : 350  
Rack travel in mm : 7.20...7.40

CONSTANT REGULATION

Speed rpm : 360...550

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 700  
Rack travel in m: 13.60...13.70  
3rd speed rpm : 900  
Rack travel in m: 12.90...13.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.60...9.70

Measurement

Speed 1/min : 500

1st pressure hPa : 255  
Rack travel in m: 10.60...10.70  
2nd pressure hPa : 580  
Rack travel in m: 12.20...12.60  
3rd pressure hPa : 900  
Rack travel in m: 13.60...13.70

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 159.0...161.0  
1000 s: (157.0...163.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 76.0...78.0  
1000 s: (74.0...80.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1150...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 205.0...225.0  
1000 s: (202.0...228.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.20...7.40  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (14.0...22.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark/lock = 8.0°  
angular displacement of the cam after  
start of delivery of cylinder 1.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : CUM 8,3 F  
 Edition : 10.02.89  
 Replaces : 29.04.88  
 Test oil : ISO-4113

Combination no. : 0 403 436 105GA

Injection pump  
 Pump designation : PES6MW100/120RS1169  
 EP type number : 0 413 406 153  
 Governor  
 Governor design. : RQV350...1100MW78-1  
 Governor no. : 0 420 083 156

Cust. part no. : 3914828

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA-8.3  
 Rated speed : 2200

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.40...12.50

Del.quantity cm<sup>3</sup>/ : 13.5...13.7

100 s: (13.3...13.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del.quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (1.0...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

### (B) Setting of injection pump with governor

#### GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.60...9.20

2nd speed rpm : 1250

travel mm : 7.60...7.80

3rd speed rpm : 800

travel mm : 4.90...5.50

4th speed rpm : 350

travel mm : 1.30...1.70

#### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 135.0...137.0

1000 : (133.0...139.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

#### RATED SPEED

1st version

Control lever  
position degrees: 44...52

Testing:

1st rack travel in: 11.40  
Speed rpm : 1250...1260  
2nd rack travel in: 4.00  
Speed rpm : 1350...1380  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 8...16  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.1

Testing:

Speed rpm : 100  
Minimum rack trave: 7.70  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : 320  
Rack travel in m: 11.70...11.80  
2nd pressure hPa : 400  
Rack travel in m: 12.00...12.30  
3rd pressure hPa : 900  
Rack travel in m: 12.40...12.50

START CUT-OUT

Speed 1/min : 220 (230)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm3/ : 128.0...132.0  
1000 s: (126.0...134.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 108.0...110.0  
1000 s: (106.0...112.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1250...1260

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 222.0...232.0  
1000 s: (219.0...235.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 12.0...16.0  
1000 s: (10.0...18.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 D10  
 Edition : 28.04.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 436 110

Injection pump  
 Pump designation : PES6MW100/120RS1143  
 EP type number : 0 413 406 137  
 Governor  
 Governor design. : RQV350...1100MW82-5  
 Governer no. : 0 420 083 177

Cust. part no. : 3913639

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA

1st version kW : 179.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values

## BEGINNING OF DELIVERY

F04

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15  
 : (3.00...3.20)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.60...11.70

Del.quantity cm<sup>3</sup>/ : 13.5...13.7

100 s: (13.3...13.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.0...7.2

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.4...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1240

travel mm : 8.80...9.20

2nd speed rpm : 1140

travel mm : 7.80...8.00

3rd speed rpm : 700

travel mm : 3.80...4.40

4th speed rpm : 350

travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 135.0...137.0

1000 : (133.0...139.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

### 1st version

#### Control lever

position degrees: 43...51

#### Testing:

1st rack travel in: 10.60  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

#### Control lever

position degrees: 9...17  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack trave: 9.00  
Speed rpm : 350  
Rack travel in mm : 7.00...7.20

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.60...11.70  
2nd speed rpm : 700  
Rack travel in m: 12.90...13.00  
3rd speed rpm : 900  
Rack travel in m: 12.40...12.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 11.10...11.20  
2nd pressure hPa : 520  
Rack travel in m: 12.30...12.60  
3rd pressure hPa : 900  
Rack travel in m: 12.90...13.00

#### START CUT-OUT

Speed 1/min : 270 (280)

#### FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 155.0...158.0  
1000 s: (152.5...160.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 98.0...100.0  
1000 s: (96.0...102.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 205.0...225.0  
1000 s: (202.0...228.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.00...7.20  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (14.0...22.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

:  
Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : CUM 8,3 D12

Edition : 07.04.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 436 111

### Injection pump

Pump designation : PES6MW100/120RS1143

EP type number : 0 413 406 137

### Governor

Governor design. : RQV350...1200MW82-6

Governer no. : 0 420 083 184

Cust. part no. : 3916000

### Customer-spec. information

Customer : CUMMINS/US

Engine : 6 CTA-830

Rated speed : 2400

### TEST BENCH REQUIREMENTS

#### Test oil

inlet temp. °C : 38...42

#### Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 017

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.15...3.25  
(3.10...3.30)  
Rack travel in mm : 9.00...12.00  
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 13.8...14.0

100 s: (13.6...14.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.1...7.2

Del.quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (1.0...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

### (B) Setting of injection pump with governor

#### GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 7.60...7.80

2nd speed rpm : 1350

travel mm : 8.60...9.00

3rd speed rpm : 350

travel mm : 1.20...1.60

4th speed rpm : 800

travel mm : 4.90...5.50

### FULL LOAD DELIV. AT FULL LOAD STOP

#### 1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 138.0...140.0

1000 : (136.0...142.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

### RATED SPEED

#### 1st version

Control Lever  
position degrees: 42...50

Testing:

1st rack travel in: 11.10  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1370...1400  
4th rack travel in: 1455  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 11...19  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.1

Testing:

Speed rpm : 100  
Minimum rack trave: 9.00  
Speed rpm : 350  
Rack travel in mm : 7.10...7.20

CONSTANT REGULATION

Speed rpm : 360...500

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 750  
Rack travel in m: 12.60...12.70  
3rd speed rpm : 1000  
Rack travel in m: 12.10...12.20  
4th speed rpm : 900  
Rack travel in m: 12.20...12.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.70...10.80

Measurement

Speed 1/min : 500

1st pressure hPa : 390  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 480  
Rack travel in m: 11.60...11.90  
3rd pressure hPa : 700  
Rack travel in m: 12.60...12.70

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ 1000 s: 139.0...142.0  
1000 s: (136.5...144.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ 1000 s: 100.0...102.0  
1000 s: (98.0...104.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.10  
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 205.0...225.0  
1000 s: (202.0...228.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.10...7.20  
Del.quantity cm<sup>3</sup>/ 1000 s: 12.0...16.0  
1000 s: (10.0...18.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 4,5 L  
 Edition : 07.04.89  
 Replaces : 12.09.86  
 Test oil : ISO-4113

Combination no. : 0 403 444 111

Injection pump  
 Pump designation : PES4MW100/320RS1116  
 EP type number : 0 413 404 102  
 Governor  
 Governor design. : RQV300...1100MW39-5  
 Governer no. : 0 420 083 068

## Customer-spec. information

Customer : VOLVO

Engine : TD45B

1st version kW : 85.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 173...176

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.00...13.10

Del.quantity cm<sup>3</sup>/ : 11.5...11.7

100 s: (11.3...11.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.5

Del.quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1225

travel mm : 9.40...9.80

2nd speed rpm : 1150

travel mm : 8.30...8.50

3rd speed rpm : 600

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.00...1.40

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 115.0...117.0

1000 : (113.0...119.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 44...52

Testing:  
 1st rack travel in: 12.00  
 Speed rpm : 1140...1150  
 2nd rack travel in: 4.00  
 Speed rpm : 1225...1255  
 4th rack travel in: 1350  
 Speed rpm : 0.00...1.00

Spread cm<sup>3</sup> : 3.50  
 1000 s: (5.50)

Remarks:

LOW IDLE 1  
 Control lever  
 position degrees: 10...18  
 Setting point w/out bumper spring  
 Speed rpm : 300  
 Rack travel in mm : 6.4

Testing:  
 Speed rpm : 100  
 Minimum rack travel: 8.00  
 Speed rpm : 300  
 Rack travel in mm : 6.40...6.50

CONSTANT REGULATION  
 Speed rpm : 320...450

#### FUEL DELIVERY CHARACTERISTICS

1st version  
 Speed rpm : 1000  
 Del.quantity cm<sup>3</sup>/ : 115.5...118.5  
 1000 s: (113.0...121.0)  
 Spread cm<sup>3</sup> : 5.50  
 1000 s: (7.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 100

#### BREAKAWAY

1st version  
 1mm rack travel less than  
 full load rack tr: 12.00  
 Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 150.0...160.0  
 1000 s: (147.0...163.0)

#### LOW IDLE

Speed rpm : 300  
 Rack travel in mm : 6.40...6.50  
 Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
 1000 s: (10.5...19.5)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 30  
 Edition : 30.09.88  
 Replaces : 24.07.87  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 145  
 Injection pump  
 Pump designation : PES6MN100/720RS1114-  
 EP type number : 0 413 406 111  
 Governor  
 Governor design. : RQV300...1300MW48  
 Governor no. : 0 420 083 066  
 Customer-spec. information  
 Customer : DB  
 Engine : OM366A  
 1st version kW : 125.0

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test Lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

**(A) Injection pump setting values**

Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.8...7.9

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.50...9.90

2nd speed rpm : 1350

travel mm : 8.50...8.70

3rd speed rpm : 450

travel mm : 2.40...3.00

4th speed rpm : 300

travel mm : 1.20...1.60

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1330

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Del.quantity : 77.0...79.0

1000 : (75.0...81.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 48...56

Testing:

1st rack travel in: 10.00  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1430...1460  
4th rack travel in: 1520  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.8

Testing:

Speed rpm : 100  
Minimum rack travel: 9.40  
Speed rpm : 300  
Rack travel in mm : 7.80...7.90  
Rack travel in mm : 2.00  
Speed rpm : 500...560

CONSTANT REGULATION

Speed rpm : 330...600

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 700  
Rack travel in m: 12.10...12.20  
3rd speed rpm : 720  
Rack travel in m: 12.10...12.20  
4th speed rpm : 800  
Rack travel in m: 11.80...12.00  
5th speed rpm : 900  
Rack travel in m: 11.40...11.70

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700  
Del.quantity cm3/ : 74.5...77.5  
1000 s: (72.0...80.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.80...7.90  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (7.0...15.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 6,1 N 6  
 Edition : 29.03.89  
 Replaces : 12.85  
 Test oil : ISO-4113

Combination no. : 0 403 446 166

Injection pump  
 Pump designation : PES6MW100/720RS1133  
 EP type number : 0 413 406 126  
 Governor  
 Governor design. : RQ325/1325MW65  
 Governer no. : 0 420 082 018

## Customer-spec. information

Customer : KHD

Engine : BF 6L 913 BW

1st version kW : 124.0  
 Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1325

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 10.2...10.4

100 s: (10.0...10.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.0...7.1

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1460

travel mm : 8.60...9.20

2nd speed rpm : 1380

travel mm : 6.50...6.70

3rd speed rpm : 425

travel mm : 4.00...4.40

4th speed rpm : 300

travel mm : 2.00...2.40

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 700

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1325

Aneroid pressure h: 800

Del.quantity : 102.0...104.0

1000 : (100.0...106.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 26...34

Setting point:  
Speed rpm : 700  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 10.10  
Speed rpm : 1370...1385  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.10...1.00

LOW IDLE 1  
Control Lever  
position degrees: 8...16  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.0

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.60  
Speed rpm : 300  
Rack travel in mm : 7.00...7.10

CONSTANT REGULATION  
Speed rpm : 340...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 450  
Rack travel mm : 10.50...10.60

Measurement  
Speed 1/min : 500

1st pressure hPa : 800  
Rack travel in m: 11.10...11.20  
2nd pressure hPa : -  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 350  
Rack travel in m: 9.90...10.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 800  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 94.0...98.0  
1000 s: (92.0...100.0)

Spread cm<sup>3</sup> : 3.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 56.0...58.0  
1000 s: (54.0...60.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 100

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1370...1385

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...140.0  
1000 s: (117.0...143.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.00...7.10  
Del.quantity cm<sup>3</sup>/ : 11.0...15.0  
1000 s: (9.0...17.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 6,1 N 9  
 Edition : 29.03.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 186  
 Injection pump  
 Pump designation : PES6MW100/720RS1133  
 EP type number : 0 413 406 126  
 Governor  
 Governor design. : RQV325...1325MW79  
 Governer no. : 0 420 083 123

## Customer-spec. information

Customer : KHD  
 Engine : BF 6L 913

1st version kW : 124.0  
 Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1325

Rack travel in mm : 10.50...10.60

Del.quantity cm<sup>3</sup>/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 6.8...6.9

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1375

travel mm : 8.70...8.90

2nd speed rpm : 1430

travel mm : 9.50...9.90

3rd speed rpm : 325

travel mm : 1.50...1.90

4th speed rpm : 600

travel mm : 2.70...3.30

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1400

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1325

Aneroid pressure h: 900

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 50...58

Testing:

1st rack travel in: 9.50  
Speed rpm : 1370...1380  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1550  
Speed rpm : 0.10...1.00

LOW IDLE 1

Control lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.8

Testing:

Speed rpm : 100  
Minimum rack travel: 8.60  
Speed rpm : 325  
Rack travel in mm : 6.80...6.90

CONSTANT REGULATION

Speed rpm : 350...650

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 450  
Rack travel mm : 9.90...10.00

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.00  
2nd pressure hPa : 350  
Rack travel in m: 9.30...9.60  
3rd pressure hPa : 900  
Rack travel in m: 10.50...10.60

START CUT-OUT

Speed 1/min : 245 (255)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm3/ : 93.0...97.0  
1000 s: (91.0...99.0)

Spread cm<sup>3</sup> : 3.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 57.0...59.0  
1000 s: (55.0...61.0)

RACK STOP ADJUSTMENT

Speed rpm : 100

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.50  
Speed rpm : 1370...1380

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 6.80...6.90  
Del.quantity cm<sup>3</sup>/ : 11.0...15.0  
1000 s: (9.0...17.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,6 T  
 Edition : 28.04.89  
 Replaces : 09.12.88  
 Test oil : ISO-4113

Combination no. : 0 403 446 198

**Injection pump**  
 Pump designation : PES6MW100/320RS1160  
 EP type number : 0 413 406 147  
 Governor  
 Governor design. : RQV350...1200MW46-16  
 Governer no. : 0 420 083 147

**Customer-spec. information**  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 176.4  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 037

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 016

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.30...12.40

Del.quantity cm<sup>3</sup>/ : 11.8...12.0

100 s: (11.6...12.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.5...6.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
 travel mm : 8.30...8.50

2nd speed rpm : 1460  
 travel mm : 9.10...9.50

3rd speed rpm : 550  
 travel mm : 3.10...3.70

4th speed rpm : 350  
 travel mm : 1.30...1.70

### FULL LOAD DELIV. AT FULL LOAD STOP

#### 1st version

Speed rpm : 800

Aneroid pressure h: 800

Del.quantity : 118.0...120.0  
 1000 : (116.0...122.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

### RATED SPEED

#### 1st version

Control lever  
 position degrees: 44...49

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1260...1280  
2nd rack travel in: 4.00  
Speed rpm : 1385...1395  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 12...20  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 100  
Minimum rack trave: 9.00  
Speed rpm : 350  
Rack travel in mm : 6.50...6.60

CONSTANT REGULATION  
Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 800  
Pressure hPa : 180  
Rack travel mm : 10.30...10.40

Measurement  
Speed 1/min : 800

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 480  
Rack travel in m: 11.80...12.10  
3rd pressure hPa : 800  
Rack travel in m: 12.30...12.40

START CUT-OUT

Speed 1/min : 180 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 800  
Speed rpm : 1200  
Del.quantity cm3/ : 120.0...124.0  
1000 s: (118.0...126.0)  
Spread cm3 : 6.50  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 800  
Del.quantity cm3/ : 80.0...82.0  
1000 s: (78.0...84.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1260...1280

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.50...6.60  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:  
Perform pump setting only with IH hose  
with restriction of 1.2 mm diameter.

Before checking sleeve position,  
first adjust latching.

In unlatched condition, do not  
operate greater than n = 500 1/min

Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before  
shutoff.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 6,2 D  
 Edition : 14.04.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 446 218

Injection pump  
 Pump designation : PES6MW100/320RS1179  
 EP type number : 0 413 406 161  
 Governor  
 Governor design. : RQV275...1175MW80-2  
 Governor no. : 0 420 083 180

Customer-spec. information  
 Customer : RVI

Engine : MIDR 060226K

1st version kW : 160.0  
 Rated speed : 2350

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 033

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 16.50...19.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1175

Del.quantity cm<sup>3</sup>/ : 13.0...13.2

100 s: (12.8...13.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 275.0

Rack travel in mm : 7.5...7.7

Del.quantity cm<sup>3</sup>/ : 2.8...3.2

100 s: (2.5...3.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1375

travel mm : 8.60...9.00

2nd speed rpm : 1225

travel mm : 7.60...7.80

3rd speed rpm : 500

travel mm : 3.20...3.80

4th speed rpm : 275

travel mm : 1.30...1.70

## GUIDE SLEEVE POSITION

## Control-lever position

Degree: -1

Speed rpm : 1360

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 1175

Aneroid pressure h: 1000

Del.quantity : 130.0...132.0

1000 : (128.0...134.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

## 1st version

Control lever  
position degrees: 47...55

Del.quantity cm<sup>3</sup>/ : 53.0...55.0  
1000 s: (51.0...57.0)

Testing:

1st rack travel in: 12.40  
Speed rpm : 1260...1270  
2nd rack travel in: 4.00  
Speed rpm : 1430...1470  
4th rack travel in: 1550  
Speed rpm : 1.00...0.00

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 1260...1270

LOW IDLE 1

Control lever  
position degrees: 12...20  
Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 7.6

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 98.0...112.0  
1000 s: (95.0...115.0)  
Rack travel in mm : 19.50...21.00

Testing:

Speed rpm : 100  
Minimum rack trave: 7.40  
Speed rpm : 275  
Rack travel in mm : 5.70...5.90

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 28.0...32.0  
1000 s: (25.5...34.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Aneroid/Altitude  
Compensator Test

Remarks:

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.40...13.50

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 160  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 480  
Rack travel in m: 12.60...12.90

START CUT-OUT

Speed 1/min : 200 (220)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 126.5...129.5  
1000 s: (124.0...132.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 62  
 Edition : 29.03.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 446 222

Injection pump  
 Pump designation : PES6MW100/720RS1131  
 EP type number : 0 413 406 123  
 Governor  
 Governor design. : RQV300...1300MW62-2  
 Governer no. : 0 420 083 186

## Customer-spec. information

Customer : DB-NKW

Engine : OM 366 LA

1st version kW : 150.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 715 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.75)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.60...11.70

Del.quantity cm<sup>3</sup>/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.2

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.50...9.90

2nd speed rpm : 1350

travel mm : 8.50...8.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1340

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 96.0...98.0

1000 : (94.0...100.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 51...59

Testing:

1st rack travel in: 10.60  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.1

Testing:

Speed rpm : 100  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.00...6.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 170  
Rack travel mm : 10.10...10.20

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...9.90  
2nd pressure hPa : 225  
Rack travel in m: 11.20...11.50  
3rd pressure hPa : 700  
Rack travel in m: 11.60...11.70

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 82.5...85.5  
1000 s: (80.0...88.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 52.0...54.0  
1000 s: (50.0...56.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.60  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 83.0...93.0  
1000 s: (80.0...96.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : B 6,0 D 67  
 Edition : 14.04.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 446 224

Injection pump  
 Pump designation : PES6MW100/720RS1172  
 EP type number : 0 413 406 155  
 Governor  
 Governor design. : RQV300...1300MW67-2  
 Governor no. : 0 420 083 189

Customer-spec. information  
 Customer : DB-NKW

Engine : OM 366 LA

1st version kW : 170.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 19.00...21.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.40...14.50

Del.quantity cm<sup>3</sup> : 10.5...10.7

100 s: (10.3...10.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.8...6.0

Del.quantity cm<sup>3</sup> : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1460

travel mm : 9.70...10.10

2nd speed rpm : 1360

travel mm : 8.30...8.50

3rd speed rpm : 600

travel mm : 3.50...4.10

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 105.0...107.0

1000 : (103.0...109.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:

1st rack travel in: 13.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1430...1460  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.70...11.80

Measurement  
Speed 1/min : 500

1st pressure hPa : 450  
Rack travel in m: 12.40...12.50  
2nd pressure hPa : 550  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1000  
Rack travel in m: 14.40...14.50

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 92.0...95.0  
1000 s: (89.5...97.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 42.0...44.0  
1000 s: (40.0...46.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...100.0  
1000 s: (87.0...103.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.80...6.00  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 69  
 Edition : 21.04.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 225  
 Injection pump  
 Pump designation : PES6MW100/720RS1144-  
 1  
 EP type number : 0 413 406 159  
 Governor  
 Governor design. : RQV300...1400MW48-11  
 Governer no. : 0 420 083 190  
 Customer-spec. information  
 Customer : DB-NKW  
 Engine : OM366A  
 1st version kW : 125.0  
 Rated speed : 2800

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 0 681 343 009  
 Opening pressure, bar : 172...175  
 Test Lines : 1 680 750 015  
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600

**(A) Injection pump setting values**

Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 10.90...11.00

Del.quantity cm<sup>3</sup>/ : 7.5...7.7

100 s: (7.3...7.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.8...8.0

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1550

travel mm : 9.20...9.60

2nd speed rpm : 1450

travel mm : 8.30...8.50

3rd speed rpm : 550

travel mm : 2.80...3.40

4th speed rpm : 300

travel mm : 1.00...1.40

### GUIDE SLEEVE POSITION

#### Control-lever position

Degree: -1

Speed rpm : 1450

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 75.0...77.0

1000 : (73.0...79.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 48...56

Testing:

1st rack travel in: 9.90  
Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1530...1560  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.9

Testing:

Speed rpm : 100  
Minimum rack trave: 9.50  
Speed rpm : 300  
Rack travel in mm : 7.80...8.00

TORQUE CONTROL

Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 800  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 1000  
Rack travel in m: 11.10...11.30

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 67.5...70.5  
1000 s: (65.0...73.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 80.0...90.0  
1000 s: (77.0...93.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.80...8.00  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 L 1  
 Edition : 28.11.88  
 Replaces : 27.10.88  
 Test oil : ISO-4113

Combination no. : 0 403 456 101

Injection pump  
 Pump designation : PES6MW100/321RS1153  
 EP type number : 0 413 406 145  
 Governor  
 Governor design. : RQ250/1300MW84  
 Governer no. : 0 420 082 029

## Customer-spec. information

Customer : MAN

Engine : D 0826 LF

1st version kW : 165.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 4.9...5.1

Del.quantity cm<sup>3</sup>/ : 1.8...2.2

100 s: (1.5...2.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1440

travel mm : 8.70...9.10

2nd speed rpm : 1360

travel mm : 6.30...6.50

3rd speed rpm : 380

travel mm : 4.10...4.70

4th speed rpm : 250

travel mm : 1.50...1.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

### 1st version

#### Control lever

position degrees: 26...34

#### Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

#### Testing:

1st rack travel in: 10.50

Speed rpm : 1345...1360

2nd rack travel in: 4.00

Speed rpm : 1440...1460

4th rack travel in: 1530

Speed rpm : 0.00...1.00

## LOW IDLE 1

### Control lever

position degrees: 6...14

#### Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100

Minimum rack trave: 7.00

Speed rpm : 250

Rack travel in mm : 4.90...5.10

## Aneroid/Altitude

### Compensator Test

### 1st version

#### Setting

Speed rpm : 500

Pressure hPa : 180

Rack travel mm : 9.40...9.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.10...9.20

2nd pressure hPa : 385

Rack travel in m: 10.70...11.00

3rd pressure hPa : 1000

Rack travel in m: 11.50...11.60

## START CUT-OUT

Speed 1/min : 180 (200)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ 1000 s: 129.0...132.0  
1000 s: (126.5...134.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ 1000 s: 131.0...134.0  
1000 s: (128.5...136.5)  
Aneroid pressure h: 1000  
Speed rpm : 1300  
Del.quantity cm<sup>3</sup>/ 1000 s: 132.5...135.5  
1000 s: (130.0...138.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ 1000 s: 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 10.50

Speed rpm : 1345...1360

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 130.0...140.0  
1000 s: (127.0...143.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ 1000 s: 18.0...22.0  
1000 s: (15.5...24.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MAN 7,2 L 2

Edition : 28.04.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 456 103

### Injection pump

Pump designation : PES6MW100/321RS1153

EP type number : 0 413 406 145

### Governor

Governor design. : RQV250...1100MW83-1

Governer no. : 0 420 083 182

Cust. part no. : 2-7947

### Customer-spec. information

Customer : MAN

Engine : D 0826 L/204

1st version kW : 150.0

Rated speed : 2200

### TEST BENCH REQUIREMENTS

#### Test oil

inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant. per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
(2.95...3.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 11.40...11.50

Del.quantity cm<sup>3</sup>/ : 13.2...13.4

100 s: (13.0...13.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 4.8...5.0

Del.quantity cm<sup>3</sup>/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

### (B) Setting of injection pump with governor

#### GUIDE SLEEVE TRAVEL

1st speed rpm : 1210

travel mm : 11.10...11.50

2nd speed rpm : 1150

travel mm : 10.20...10.40

3rd speed rpm : 550

travel mm : 3.20...3.80

4th speed rpm : 250

travel mm : 1.10...1.50

#### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 132.0...134.0

1000 : (130.0...136.0)

Spread      cm<sup>3</sup> : 3.50  
              1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 54...62

#### Testing:

1st rack travel in: 10.40  
Speed      rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed      rpm : 1195...1225  
4th rack travel in: 1300  
Speed      rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed      rpm : 250  
Rack travel in mm : 4.9

#### Testing:

Speed      rpm : 100  
Minimum rack trave: 7.00  
Speed      rpm : 250  
Rack travel in mm : 4.80...5.00

#### CONSTANT REGULATION

Speed      rpm : 310...400

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed      rpm : 500  
Pressure    hPa : 220  
Rack travel mm : 9.10...9.20

Measurement  
Speed      1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.80...8.90  
2nd pressure hPa : 480  
Rack travel in m: 10.70...11.00  
3rd pressure hPa : 1000  
Rack travel in m: 11.40...11.50

#### START CUT-OUT

Speed      1/min : 180 (200)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed      rpm : 600  
Del.quantity cm<sup>3</sup>/ : 129.0...132.0  
1000 s: (126.5...134.5)  
Spread      cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed      rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 131.5...134.5  
1000 s: (129.0...137.0)  
Aneroid pressure h: -  
Speed      rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.40  
Speed      rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed      rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)

#### LOW IDLE

Speed      rpm : 250  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread      cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 0  
 Edition : 07.04.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 456 104  
 Injection pump  
 Pump designation : PES6MM100/321RS1180  
 EP type number : 0 413 406 163  
 Governor  
 Governor design. : RQ250/1300MW84-1  
 Governer no. : 0 420 082 037  
 Customer-spec. information  
 Customer : MAN  
 Engine : D 0826 LUH  
 1st version kW : 157.0  
 Rated speed : 2600  
**TEST BENCH REQUIREMENTS**  
 Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test Lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600  
**(A) Injection pump setting values**  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_  
**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32  
 Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1  
**BASIC SETTING**  
 1st speed rpm : 1000  
 Rack travel in mm : 11.60...11.70  
 Del.quantity cm<sup>3</sup>/ : 12.6...12.8  
 : 100 s: (12.4...13.0)  
 Spread cm<sup>3</sup> : 0.3  
 : 100 s: (0.6)  
 2nd speed rpm : 250.0  
 Rack travel in mm : 5.2...5.4  
 Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
 : 100 s: (1.5...2.4)  
 Spread cm<sup>3</sup> : 0.3  
 : 100 s: (0.5)

## (B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**  
 1st speed rpm : 1320  
 travel mm : 8.60...9.00  
 2nd speed rpm : 1260  
 travel mm : 6.50...6.70  
 3rd speed rpm : 350  
 travel mm : 3.40...4.00  
 4th speed rpm : 250  
 travel mm : 1.50...2.10

**GUIDE SLEEVE POSITION**  
 Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1000  
 Del.quantity : 126.0...128.0  
 : 1000 : (124.0...130.0)  
 Spread cm<sup>3</sup> : 3.50  
 : 1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 26...34

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.60

Speed rpm : 1245...1260

2nd rack travel in: 4.00

Speed rpm : 1305...1335

4th rack travel in: 1450

Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever

position degrees: 6...14

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 5.3

Testing:

Speed rpm : 100

Minimum rack trave: 7.30

Speed rpm : 250

Rack travel in mm : 5.20...5.40

## Aneroid/Altitude

Compensator Test

## 1st version

Setting

Speed rpm : 500

Pressure hPa : 200

Rack travel mm : 9.60...9.70

## Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.30...9.40

2nd pressure hPa : 400

Rack travel in m: 10.90...11.20

3rd pressure hPa : 1000

Rack travel in m: 11.60...11.70

## START CUT-OUT

Speed 1/min : 180 (200)

## FUEL DELIVERY CHARACTERISTICS

## 1st version

Aneroid pressure h: 1000

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ 1000 s: 123.0...126.0  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ 1000 s: 125.5...128.5  
1000 s: (123.0...131.0)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ 1000 s: 125.5...128.5  
1000 s: (123.0...131.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ 1000 s: 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 130.0...140.0  
1000 s: (127.0...143.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ 1000 s: 18.0...22.0  
1000 s: (15.5...24.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

## Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 C  
 Edition : 07.02.89  
 Replaces : 06.04.88  
 Test oil : ISO-4113

Combination no. : 0 403 466 101

Injection pump  
 Pump designation : PES6MM100/120RS1137  
 EP type number : 0 413 406 131  
 Governor  
 Governor design. : RSV400...1250MW2A319  
 Governor no. : 0 420 085 059

## Customer-spec. information

Customer : CUMMINS/US

Engine : 6 CTA-8.3 L

1st version kW : 188.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 14.4...14.6

100 s: (14.2...14.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 7.9...8.0

Del.quantity cm<sup>3</sup>/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 144.5...146.5

1000 : (142.5...148.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...58

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.00  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1380...1410  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 7.9

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 7.90...8.00

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 4.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 139.0...142.0  
1000 s: (136.5...144.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...145.0  
1000 s: (122.0...148.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 7.90...8.00  
Del.quantity cm<sup>3</sup>/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

G05

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Starting/full-load transition speed  
from holding magnet = 500 1/min.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 C 5  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 466 101BA

Injection pump  
 Pump designation : PES6MW100/120RS1137  
 EP type number : 0 413 406 131  
 Governor  
 Governor design. : RSV400...1250MW2A319  
 Governer no. : 0 420 085 059

Cust. part no. : 3811546

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA

1st version kW : 186.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 14.4...14.6

100 s: (14.2...14.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 500.0

Rack travel in mm : 7.9...8.1

Del.quantity cm<sup>3</sup>/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 144.5...146.5

1000 : (142.5...148.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...58

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.00  
Speed rpm : 1285...1295  
2nd rack travel in: 4.00  
Speed rpm : 1370...1400  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 500  
Rack travel in mm : 8.0

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 500  
Rack travel in mm : 7.90...8.10

SET IDLE AUXILIARY SPRING

Rack travel in mm : 4.00

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1285...1295

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...145.0  
1000 s: (122.0...148.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 500  
Rack travel in mm : 7.90...8.10  
Del.quantity cm<sup>3</sup>/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Starting/full-load transition speed  
from holding magnet = 500 1/min.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 E 1  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 466 107DA

Injection pump  
 Pump designation : PES6MW100/120RS1148  
 EP type number : 0 413 406 143  
 Governor  
 Governor design. : RSV400...900MW7A319-5

Governor no. : 0 420 085 082

Cust. part no. : 3909342

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA

1st version kW : 171.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 13.00...13.10

Del.quantity cm<sup>3</sup> : 17.9...18.1

100 s: (17.7...18.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.9...6.0

Del.quantity cm<sup>3</sup> : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 179.0...181.0

1000 : (177.0...183.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 47...55

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

from holding magnet = 500 1/min.

Testing:

1st rack travel in: 12.00  
Speed rpm : 790...800  
2nd rack travel in: 4.00  
Speed rpm : 825...855  
4th rack travel in: 1000  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control Lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.90...6.00

SET IDLE AUXILIARY SPRING

Rack travel in mm : 4.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 790...800

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...145.0  
1000 s: (122.0...148.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.90...6.00  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

Starting/full-load transition speed

609

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 C11  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 466 110

Injection pump  
 Pump designation : PES6MW100/120RS1137  
 EP type number : 0 413 406 131  
 Governor  
 Governor design. : RSV500...1250MW2A319  
 →6

Governer no. : 0 420 085 102

Cust. part no. : 3915688

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA-8.3 L

1st version kW : 171.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 12.80...12.90

Del.quantity cm<sup>3</sup>/ : 13.4...13.6

100 s: (13.2...13.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 500.0

Rack travel in mm : 6.5...6.7

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 134.0...136.0

1000 : (132.0...138.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...58

Setting point:  
Speed rpm : 800  
Rack travel in mm : 0.6

Testing:  
1st rack travel in: 11.80  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1380...1410  
4th rack travel in: 1550  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control Lever  
position degrees: 23...31  
Setting point w/out bumper spring  
Speed rpm : 500  
Rack travel in mm : 6.6

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 500  
Rack travel in mm : 6.50...6.70

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 4.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 750  
Del.quantity cm3/ : 126.5...129.5  
1000 s: (124.0...132.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...145.0  
1000 s: (122.0...148.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 500  
Rack travel in mm : 6.50...6.70

Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 C 7  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 466 111

Injection pump  
 Pump designation : PES6MW100/120RS1137  
 EP type number : 0 413 406 131  
 Governor  
 Governor design. : RSV400...1250MW2A319  
 -7

Governer no. : 0 420 085 103

Cust. part no. : 3915969

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA-8.3 L

1st version kW : 188.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 14.4...14.6

100 s: (14.2...14.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 7.9...8.1

Del.quantity cm<sup>3</sup>/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 144.5...146.5

1000 : (142.5...148.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...58

Setting point:  
Speed rpm : 800  
Rack travel in mm : 0.6

Testing:  
1st rack travel in: 13.00  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1380...1410  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 8.0

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 7.90...8.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 139.0...142.0  
1000 s: (136.5...144.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...145.0  
1000 s: (122.0...148.0)  
Pack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 7.90...8.10  
Del.quantity cm<sup>3</sup>/ : 19.0...23.0  
1000 s: (16.5...25.5)

Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Starting/full-load transition speed  
from holding magnet = 500 1/min.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 C10  
 Edition : 22.12.88  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 466 112

Injection pump  
 Pump designation : PES6MW100/120RS1137  
 EP type number : 0 413 406 131  
 Governor  
 Governor design. : RSV425...1100MW2A319  
 -8

Governer no. : 0 420 085 104

Cust. part no. : 3915970

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA-8.3 L

1st version kW : 188.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.10...14.20

Del.quantity cm<sup>3</sup>/ : 14.2...14.4

100 s: (14.0...14.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 425.0

Rack travel in mm : 7.7...7.9

Del.quantity cm<sup>3</sup>/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 142.0...144.0

1000 : (140.0...146.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 42...50

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.10  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1300  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 7.8

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 425  
Rack travel in mm : 7.70...7.90

SET IDLE AUXILIARY SPRING

Rack travel in mm : 4.00

TORQUE CONTROL

Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.10...14.20  
2nd speed rpm : 750  
Rack travel in m: 14.70...14.80  
3rd speed rpm : 900  
Rack travel in m: 14.30...14.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 148.5...151.5  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 125.0...145.0  
1000 s: (122.0...148.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 425  
Rack travel in mm : 7.70...7.90  
Del.quantity cm<sup>3</sup>/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

Starting/full-load transition speed  
from holding magnet = 500 1/min.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 H 2  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 466 113

Injection pump  
 Pump designation : PES6MW100/120RS1137-  
 1

EP type number : 0 413 406 157

Governor

Governor design. : RSV450...1100MW2A319  
 -13

Governor no. : 0 420 085 114

Cust. part no. : 3195686

## Customer-spec. information

Customer : CUMMINS/US

Engine : 6 CTA

Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 9 410 270 183

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/

100 s: (14.8...15.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 6.9...7.1

Del.quantity cm<sup>3</sup>/

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 150.5...152.5

1000 : (148.5...154.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
 position degrees: 42...50

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

### Testing:

1st rack travel in: 10.90  
Speed rpm : 1150...1160  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1370  
Speed rpm : 0.30...1.70

### LOW IDLE 1

Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 7.0

### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 450  
Rack travel in mm : 6.90...7.10

### SET IDLE AUXILIARY SPRING

Rack travel in mm : 4.00

### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 750  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1100  
Rack travel in m: 12.50...12.70  
3rd speed rpm : 950  
Rack travel in m: 13.20...13.60

### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 130.5...133.5  
1000 s: (128.0...136.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.90  
Speed rpm : 1150...1160

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...145.0  
1000 s: (122.0...148.0)  
Rack travel in mm : 19.00...21.00

### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 6.90...7.10  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

### Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Starting/full-load transition speed  
from holding magnet = 500 1/min.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 C 8  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 466 115

Injection pump  
 Pump designation : PES6MW100/120RS1137  
 EP type number : 0 413 406 131  
 Governor  
 Governor design. : RSV400...1050MW2A319  
 -11  
 Governor no. : 0 420 085 107  
 Cust. part no. : 3915972

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA  
 1st version kW : 165.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 14.20...14.30

Del.quantity cm<sup>3</sup>/ : 15.1...15.3

100 s: (14.9...15.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 7.3...7.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 151.0...153.0

1000 : (149.0...155.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 41...49

### Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

### Testing:

1st rack travel in: 11.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1320  
Speed rpm : 0.30...1.70

### LOW IDLE 1

Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 7.4

### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 490...560

### SET IDLE AUXILIARY SPRING

Rack travel in mm : 4.00

### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 750  
Rack travel in m: 14.20...14.30  
2nd speed rpm : 1050  
Rack travel in m: 12.20...12.40  
3rd speed rpm : 950  
Rack travel in m: 13.00...13.30

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 123.5...126.5  
1000 s: (121.0...129.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1090...1100

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...145.0  
1000 s: (122.0...148.0)  
Rack travel in mm : 19.00...21.00

### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

### Remarks:

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

Starting/full-load transition speed  
from holding magnet = 500 1/min.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 E 2

Edition : 07.02.89

Replaces :

Test oil : ISO-4113

Combination no. : 0 403 466 116

## Injection pump

Pump designation : PES6MW100/120RS1148

EP type number : 0 413 406 143

Governor

Governor design. : RSV400...900MW7A319-12

Governor no. : 0 420 085 108

Cust. part no. : 3914871

## Customer-spec. information

Customer : CUMMINS/US

Engine : 6 CTA

Rated speed : 1800

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 017

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
(3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.50...13.60

Del.quantity cm<sup>3</sup>/ : 18.3...18.5

100 s: (18.1...18.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.2...6.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 183.0...185.0

1000 : (181.0...187.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever position degrees: 55...63

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

Testing:

1st rack travel in: 12.50  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 960...990  
4th rack travel in: 1125  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 25...33  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 6.3

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 6.20...6.40  
Rack travel in mm : 2.00  
Speed rpm : 430...490

SET IDLE AUXILIARY SPRING

Rack travel in mm : 4.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 181.0...185.0  
1000 s: (179.0...187.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel Less than

full load rack tr: 12.50  
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...145.0  
1000 s: (122.0...148.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.20...6.40

Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

Starting/full-load transition speed  
from holding magnet = 500 1/min.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 A 28

Edition : 24.02.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 474 002

## Injection pump

Pump designation : PES4M-M00/720RS1127

EP type number : 0 413 404 103

## Governor

Governor design. : RSV350...1200MWOA330

Governer no. : 0 420 085 101

## Customer-spec. information

Customer : DB

Engine : OM364A

1st version kW : 66.0

Rated speed : 2400

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

### Test nozzle holder

assembly : 0 681 343 009

### Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

### Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 7.1...7.3

100 s: (6.9...7.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.0...7.6

Del.quantity cm<sup>3</sup>/ : 0.9...1.1

100 s: (0.5...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 71.0...73.0

1000 : (69.0...75.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 48...56

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.30

Speed rpm : 1240...1245

	Spread	cm <sup>3</sup> : 3.50
	1000 s: (5.00)	
2nd rack travel in: 4.00		
Speed rpm : 1283...1296		
3rd rack travel in: 4.00		
Speed rpm : 1320...1350		
4th rack travel in: 1450		
Speed rpm : 0.30...1.70		
5th rack travel in: 1240...1255		
Speed rpm : 10.30		

LOW IDLE 1  
 Setting point w/out bumper spring  
 Speed rpm : 350  
 Rack travel in mm : 7.3

Testing:  
 Speed rpm : 100  
 Minimum rack travel: 19.00  
 Speed rpm : 350  
 Rack travel in mm : 7.00...7.60  
 Rack travel in mm : 2.00  
 Speed rpm : 415...475

TORQUE CONTROL  
 Torque control curve - 1st version  
 1st speed rpm : 1200  
 Rack travel in m: 11.30...11.40  
 2nd speed rpm : 600  
 Rack travel in m: 12.10...12.20  
 3rd speed rpm : 900  
 Rack travel in m: 11.70...11.80  
 4th speed rpm : 950  
 Rack travel in m: 11.50...11.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
 Speed rpm : 600  
 Del.quantity cm<sup>3</sup>/ : 58.0...60.0  
 1000 s: (56.0...62.0)  
 Speed rpm : 900  
 Del.quantity cm<sup>3</sup>/ : 73.0...75.0  
 1000 s: (71.0...77.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 s: (7.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 83.0...93.0  
 1000 s: (80.0...96.0)

#### LOW IDLE

Speed rpm : 350  
 Rack travel in mm : 7.00...7.60  
 Del.quantity cm<sup>3</sup>/ : 9.0...11.0  
 1000 s: (5.5...14.5)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 A 24

Edition : 07.02.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 474 005

## Injection pump

Pump designation : PES4MW100/720RS1127

EP type number : 0 413 404 103

## Governor

Governor design. : RSV350...750MWA318-4

Governer no. : 0 420 085 089

## Customer-spec. information

Customer : DB

Engine : OM364A

1st version kW : 63.0

Rated speed : 1500

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

### Test nozzle holder

assembly : 0 681 343 009

### Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

### Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.80...13.90

Del.quantity cm<sup>3</sup>/ : 9.5...9.7

100 s: (9.3...9.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.5...7.7

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 95.0...97.0

1000 : (93.0...99.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 12.80

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 780...793

4th rack travel in: 950

Speed rpm : 0.30...1.40

## LOW IDLE 1

### Control lever

position degrees: 11...19

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 7.5

Speed rpm : 350

Rack travel in mm : 7.50...7.60

## SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.80

Speed rpm : 750...755

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 90.0...100.0

1000 s: (87.0...103.0)

## LOW IDLE

Speed rpm : 350

Rack travel in mm : 7.50...7.70

Del.quantity cm<sup>3</sup>/ : 9.0...13.0

1000 s: (7.0...15.0)

Spread cm<sup>3</sup> : 3.50

1000 s: (5.50)

## Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 4,5 M  
 Edition : 07.04.89  
 Replaces : 18.10.88  
 Test oil : ISO-4113

Combination no. : 0 403 474 007

Injection pump  
 Pump designation : PES4MW100/320RS1175  
 EP type number : 0 413 404 105  
 Governor  
 Governor design. : RSV300...1000MW1A315  
 -1  
 Governer no. : 0 420 085 099

## Customer-spec. information

Customer : VOLVO-BM

Engine : TD45

1st version kW : 84.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 11.0...11.2

100 s: (10.8...11.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.2...8.4

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 110.0...112.0

1000 : (108.0...114.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...58

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.70

Speed rpm : 1040...1050

2nd rack travel in: 4.00

Speed rpm : 1070...1100

3rd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.7

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 7.60...7.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 111.5...114.5  
1000 s: (109.0...117.0)  
Spread cm<sup>3</sup> : 5.50  
1000 s: (7.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 8.20...8.40  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 63  
 Edition : 03.03.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 027  
 Injection pump  
 Pump designation : PES6MW100/720RS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RSV350...1300MW0A316  
 -6  
 Governer no. : 0 420 085 098  
 Customer-spec. information  
 Customer : DB  
 Engine : OM366A  
 1st version kW : 125.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 0 681 343 009  
 Opening pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300  
 Rack travel in mm : 10.70...10.80  
 Del.quantity cm<sup>3</sup>/ : 7.2...7.4  
 100 s: (7.0...7.6)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 7.0...7.6  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.1  
 100 s: (0.7...1.3)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 4.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Del.quantity : 72.0...74.0  
 1000 : (70.0...76.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 56...64

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 9.70

Speed rpm : 1340...1345  
2nd rack travel in: 4.00  
Speed rpm : 1380...1393  
3rd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70  
5th rack travel in: 1345...1360  
Speed rpm : 9.70

#### LOW IDLE 1

##### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 7.00...7.60  
Rack travel in mm : 2.00  
Speed rpm : 445...505

#### TORQUE CONTROL

##### Torque control curve - 1st version

1st speed rpm : 1300  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 700  
Rack travel in m: 12.30...12.40  
3rd speed rpm : 825  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 69.0...71.0  
1000 s: (67.0...73.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Speed rpm : 825  
Del.quantity cm<sup>3</sup>/ : 73.0...75.0  
1000 s: (71.0...77.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1340...1345

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.00...7.60  
Del.quantity cm<sup>3</sup>/ : 9.0...11.0  
1000 s: (7.0...13.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

##### Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 31  
 Edition : 05.02.88  
 Replaces : 02.11.87  
 Test oil : ISO-4113

Combination no. : 0 403 476 054

Injection pump  
 Pump designation : PES6MW100/720RS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RSV350...1200MW1A316  
 Governer no. : 0 420 085 076

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM366A

1st version kW : 115.0  
 Rated speed : 2400  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 9.60...9.70

Del.quantity cm<sup>3</sup> : 6.0...6.2

100 s: (5.8...6.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.30...6.90

Del.quantity cm<sup>3</sup> : 0.9...1.1

100 s: (0.6...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 15.0

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 60.0...62.0

1000 : (58.0...64.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 58...66

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

### Testing:

1st rack travel in: 8.60  
Speed rpm : 1240...1245  
2nd rack travel in: 4.00  
Speed rpm : 1263...1276  
3rd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70  
5th rack travel in: 1240...1255  
Speed rpm : 8.60

### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.6

### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.30...6.90  
Rack travel in mm : 2.00  
Speed rpm : 415...475

### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.60...9.70  
2nd speed rpm : 800  
Rack travel in m: 10.50...10.60  
3rd speed rpm : 950  
Rack travel in m: 9.90...10.10

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 800  
Del.quantity cm3/ : 59.0...61.0  
1000 s: (57.0...63.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 8.60  
Speed rpm : 1240...1245

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 19.00...21.00

### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.30...6.90  
Del.quantity cm3/ : 9.0...11.0  
1000 s: (6.0...14.0)  
Spread cm3 : 3.50  
1000 s: (5.00)

### Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 46  
 Edition : 03.03.89  
 Replaces : 12.08.88  
 Test oil : ISO-4113

Combination no. : 0 403 476 055

Injection pump  
 Pump designation : PES6MW100/720RS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RSV350...1200MW1A316  
 -8  
 Governer no. : 0 420 085 097

Customer-spec. information  
 Customer : DB

Engine : OM366A

1st version kW : 92.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 9.80...9.90

Del.quantity cm<sup>3</sup>/ : 6.2...6.4

100 s: (6.0...6.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.3...6.9

Del.quantity cm<sup>3</sup>/ : 0.9...1.1

100 s: (0.6...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 15.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 62.0...64.0

1000 : (60.0...66.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 48...56

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 8.80

Speed rpm : 1235...1240  
2nd rack travel in: 4.00  
Speed rpm : 1270...1283  
3rd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70  
5th rack travel in: 1245...1260  
Speed rpm : 8.80

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.30...6.90  
Rack travel in mm : 2.00  
Speed rpm : 415...475

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 800  
Rack travel in m: 10.70...10.80  
3rd speed rpm : 950  
Rack travel in m: 10.10...10.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 61.0...63.0  
1000 s: (59.0...65.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.80  
Speed rpm : 1235...1240

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.30...6.90  
Del.quantity cm<sup>3</sup>/ : 9.0...11.0  
1000 s: (6.0...14.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 37

Edition : 03.03.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 476 056

## Injection pump

Pump designation : PES6MW100/720RS1144

EP type number : 0 413 406 138

## Governor

Governor design. : RSV350...1200MW0A316  
-5

Governor no. : 0 420 085 090

## Customer-spec. information

Customer : DB

Engine : OM366A

1st version kW : 100.0

Rated speed : 2400

## TEST BENCH REQUIREMENTS

## Test oil

inlet temp. °C : 38...42

## Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.20...10.30

Del.quantity cm<sup>3</sup>/ : 6.9...7.1

100 s: (6.7...7.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.1...6.7

Del.quantity cm<sup>3</sup>/ : 0.9...1.1

100 s: (0.6...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 69.0...71.0

1000 : (67.0...73.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 58...66

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

## Testing:

1st rack travel in: 9.20

Speed rpm : 1240...1245

2nd rack travel in: 4.00

Speed rpm : 1280...1293

3rd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70  
5th rack travel in: 1240...1255  
Speed rpm : 9.20

Speed rpm : 350  
Rack travel in mm : 6.10...6.70  
Del.quantity cm<sup>3</sup>/ : 9.0...11.0  
1000 s: (6.0...14.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.4

Remarks: :  
:

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.10...6.70  
Rack travel in mm : 2.00  
Speed rpm : 415...475

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 800  
Rack travel in m: 11.10...11.20  
3rd speed rpm : 900  
Rack travel in m: 11.00...11.20  
4th speed rpm : 1050  
Rack travel in m: 10.50...10.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 69.0...71.0  
1000 s: (67.0...73.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.20  
Speed rpm : 1240...1245

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

H07

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 57

Edition : 07.02.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 476 059

## Injection pump

Pump designation : PES6M100/720RS1130

EP type number : 0 413 406 122

## Governor

Governor design. : RSV750...1250MWD325  
-1

Governor no. : 0 420 085 112

## Customer-spec. information

Customer : DB

Engine : OM 366 A

1st version kW : 125.0

Rated speed : 2500

## TEST BENCH REQUIREMENTS

## Test oil

inlet temp. °C : 38...42

## Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

## Test nozzle holder

assembly : 0 681 343 009

## Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

## Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

## (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1230

Rack travel in mm : 10.90...11.00

Del.quantity cm<sup>3</sup>/ : 7.8...8.0

100 s: (7.6...8.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 750.0

Rack travel in mm : 5.6...5.7

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1230

Del.quantity : 78.0...80.0

1000 : (76.0...82.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 46...54

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.90

Speed rpm : 1270...1275

2nd rack travel in: 4.00

Speed rpm : 1295...1310

3rd rack travel in: 4.00  
Speed rpm : 1301...1315  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70  
5th rack travel in: 1276...1280  
Speed rpm : 9.90

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 750  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 750  
Rack travel in mm : 5.60...5.70

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm3/ : 55.0...59.0  
1000 s: (53.0...61.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.90  
Speed rpm : 1270...1275

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 750  
Rack travel in mm : 5.60...5.70  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (7.0...15.0)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:  
:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 6,1 M  
 Edition : 29.03.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 476 060

Injection pump  
 Pump designation : PES6MW100/720RS1161  
 EP type number : 0 413 406 148  
 Governor  
 Governor design. : RSV325...1150MW5A327  
 Governor no. : 0 420 085 084

Customer-spec. information  
 Customer : KHD

Engine : BF6L913C

1st version kW : 134.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.45...3.55  
 : (3.40...3.60)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.80...12.90

Del.quantity cm<sup>3</sup>/ : 12.3...12.5

100 s: (12.1...12.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.0

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1000

Del.quantity : 123.0...125.0

1000 : (121.0...127.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 52...60

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.80

Speed rpm : 1200...1210

2nd rack travel in: 4.00

Speed rpm : 1245...1275

4th rack travel in: 1440  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 18...25  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 4.7

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 325  
Rack travel in mm : 4.70...4.80  
Rack travel in mm : 2.00  
Speed rpm : 455...515

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 800  
Rack travel in m: 13.20...13.30  
3rd speed rpm : 900  
Rack travel in m: 13.00...13.20  
4th speed rpm : 1000  
Rack travel in m: 12.80...13.00

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 500  
Rack travel mm : 11.60...11.70

Measurement  
Speed 1/min : 500

1st pressure hPa : 1000  
Rack travel in m: 13.20...13.30  
2nd pressure hPa : -  
Rack travel in m: 10.50...10.60  
3rd pressure hPa : 650  
Rack travel in m: 12.30...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 125.0...129.0  
1000 s: (123.0...131.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1200...1210

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.00  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 39

Edition : 03.03.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 476 062

## Injection pump

Pump designation : PES6MW100/720RS1172

EP type number : 0 413 406 155

## Governor

Governor design. : RSV350...1300MW0A329  
-1

Governer no. : 0 420 085 091

## Customer-spec. information

Customer : DB

Engine : OM 366 LA

1st version kW : 169.0

Rated speed : 2600

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

### Test nozzle holder

assembly : 0 681 343 009

### Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

### Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

Rack travel in mm : 19.00...21.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 14.40...14.50

Del.quantity cm<sup>3</sup>/ : 10.5...10.7

100 s: (10.3...10.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 1000

Del.quantity : 105.0...107.0

1000 : (103.0...109.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 46...54

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.40

Speed rpm : 1320...1330

2nd rack travel in: 4.00

Speed rpm : 1395...1425  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 12...20  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack trave: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.70...10.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : 450  
Rack travel in m: 11.90...12.10  
2nd pressure hPa : 650  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1000  
Rack travel in m: 14.40...14.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 98.0...101.0  
1000 s: (95.5...103.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 31.0...33.0  
1000 s: (29.0...35.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (6.00)

#### BREAKAWAY

H13

+ 1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1320...1330

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...100.0  
1000 s: (87.0...103.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

#### Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 5,7 A 18

Edition : 30.09.88

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 476 063

## Injection pump

Pump designation : PES6MW100/720RS1125

EP type number : 0 413 406 119

## Governor

Governor design. : RSV350...1300MW0A329  
-3

Governer no. : 0 420 085 094

## Customer-spec. information

Customer : DB

Engine : OM 362 LA

1st version kW : 134.0

Rated speed : 2600

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

### Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.20...3.30  
: (3.15...3.35)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 11.80...11.90

Del.quantity cm<sup>3</sup>/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.0

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 900

Del.quantity : 96.0...98.0

1000 : (94.0...100.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 55...63

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.80

Speed rpm : 1330...1340

2nd rack travel in: 4.00

Speed rpm : 1400...1430  
4th rack travel in: 1560  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 12...20  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.9

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.00

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.80...11.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 10.60...10.70  
2nd pressure hPa : 450  
Rack travel in m: 11.30...11.60  
3rd pressure hPa : -  
Rack travel in m: 9.70...9.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm3/ : 88.5...91.5  
1000 s: (86.0...94.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 46.0...48.0  
1000 s: (44.0...50.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 10.80  
Speed rpm : 1330...1340

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 88.0...98.0  
1000 s: (85.0...101.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.00  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (9.0...17.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 49

Edition : 30.09.88

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 476 064

Injection pump

Pump designation : PES6MW100/720RS1129

EP type number : 0 413 406 121

Governor

Governor design. : RSV350...1300MW0A329  
-2

Governer no. : 0 420 085 095

## Customer-spec. information

Customer : DB

Engine : OM 366 LA

1st version kW : 150.0

Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 9.7...9.9

100 s: (9.5...10.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.5...5.7

Del.quantity cm<sup>3</sup>/ : 0.8...1.2

100 s: (0.6...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 900

Del.quantity : 97.0...99.0

1000 : (95.0...101.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 56...64

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.50

Speed rpm : 1320...1330

2nd rack travel in: 4.00

Speed rpm : 1385...1415  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.50...5.70

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.50...9.60

##### Measurement

Speed 1/min : 500

1st pressure hPa : 175  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 300  
Rack travel in m: 10.80...11.10  
3rd pressure hPa : 900  
Rack travel in m: 11.50...11.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 900  
Speed rpm : 750  
Del.quantity cm3/ : 86.5...89.5  
1000 s: (84.0...92.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 48.0...50.0  
1000 s: (46.0...52.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 1320...1330

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 88.0...98.0  
1000 s: (85.0...101.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.50...5.70  
Del.quantity cm3/ : 8.0...12.0  
1000 s: (6.0...14.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 48  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 065  
 Injection pump  
 Pump designation : PES6MW100/720RS1129-  
 2  
 EP type number : 0 413 406 140  
 Governor  
 Governor design. : RSV350...1300MWOA331  
 Governor no. : 0 420 085 096  
 Customer-spec. information  
 Customer : DB  
 Engine : OM 366 LA  
 1st version kW : 150.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 0 681 343 009  
 Opening pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32  
 Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 11.20...11.30

Del.quantity cm<sup>3</sup>/ : 9.3...9.5

100 s: (9.1...9.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 6.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 900

Del.quantity : 93.0...95.0

1000 : (91.0...97.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 58...66

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.20  
Speed rpm : 1320...1330  
2nd rack travel in: 4.00  
Speed rpm : 1385...1415  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 26...34  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.20...9.30

Measurement  
Speed 1/min : 500  
  
1st pressure hPa : 175  
Rack travel in m: 9.80...9.90  
2nd pressure hPa : 300  
Rack travel in m: 10.80...11.10  
3rd pressure hPa : 900  
Rack travel in m: 11.20...11.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 83.0...87.0  
1000 s: (81.0...89.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 46.0...48.0  
1000 s: (44.0...50.0)

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1320...1330  
  
STARTING FUEL DELIVERY  
  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 88.0...98.0  
1000 s: (85.0...101.0)

LOW IDLE  
  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (7.0...15.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:  
:  
Test hydr. locking device for starting  
with 500...1999 hPa air pressure.

BREAKAWAY

H19

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 52

Edition : 24.02.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 476 066

## Injection pump

Pump designation : PES6MW100/720RS1130

EP type number : 0 413 406 122

## Governor

Governor design. : RSV350...1300MWD318  
-5

Governor no. : 0 420 085 100

## Customer-spec. information

Customer : DB-LKW

Engine : OM 366 A

1st version kW : 130.0

Rated speed : 2600

## TEST BENCH REQUIREMENTS

## Test oil

inlet temp. °C : 38...42

## Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 11.00...11.10

Del.quantity cm³/ : 8.1...8.3

100 s: (7.9...8.5)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.9...8.1

Del.quantity cm³/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm³ : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Del.quantity : 81.0...83.0

1000 : (79.0...85.0)

Spread cm³ : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 55...63

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.00

Speed rpm : 1330...1340  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1560  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 25...33  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 8.0

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 7.90...8.10

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 68.0...71.0  
1000 s: (65.5...73.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 1330...1340

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.90...8.10  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (7.0...15.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 57  
 Edition : 11.05.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 067  
  
 Injection pump  
 Pump designation : PES6MW100/720RS1131  
 EP type number : 0 413 406 123  
 Governor  
 Governor design. : RSV350...1300MM0A2  
 Governer no. : 0 420 085 109  
  
 Customer-spec. information  
 Customer : DB-NKW  
  
 Engine : OM 366 LA  
  
 1st version kW : 150.0  
 Rated speed : 2600  
  
**TEST BENCH REQUIREMENTS**  
  
 Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve : 1 417 413 047  
  
 Inlet press., bar : 1.50  
  
 Test nozzle holder  
 assembly : 0 681 343 009  
  
 Opening  
 pressure, bar : 172...175  
  
 Test lines : 1 680 750 015  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600  
  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_  
  
**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32  
  
 Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.60...12.70

Del.quantity cm<sup>3</sup>/ : 10.0...10.2

100 s: (9.8...10.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.2...6.9

Del.quantity cm<sup>3</sup>/ : 1.0...1.2

100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 100.0...102.0

1000 : (98.0...104.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 44...52

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.60

Speed rpm : 1340...1345  
2nd rack travel in: 4.00  
Speed rpm : 1387...1400  
3rd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1600  
Speed rpm : 0.30...1.70  
5th rack travel in: 1335...1350  
Speed rpm : 11.60

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.20...6.90  
Rack travel in mm : 2.00  
Speed rpm : 420...480

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 250  
Rack travel mm : 11.30...11.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.80...10.90  
2nd pressure hPa : 400  
Rack travel in m: 12.10...12.40  
3rd pressure hPa : 700  
Rack travel in m: 12.60...12.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 86.5...89.5  
1000 s: (84.0...92.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 53.0...55.0  
1000 s: (51.0...57.0)

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 1340...1345

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 83.0...93.0  
1000 s: (80.0...96.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.20...6.90  
Del.quantity cm3/ : 10.0...12.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

:  
Test hydr. locking device for starting  
with 500...1999 hPa air pressure.

BREAKAWAY

H23

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6.0 D 60

Edition : 03.03.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 476 069

## Injection pump

Pump designation : PES6MW100/720RS1129

EP type number : 0 413 406 121

## Governor

Governor design. : RSV750...1250MW0A325  
-2

Governer no. : 0 420 085 115

## Customer-spec. information

Customer : DB

Engine : OM 366 LA

1st version kW : 146.0

Rated speed : 2500

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1230

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 9.7...9.9

100 s: (9.5...10.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 750.0

Rack travel in mm : 4.9...5.1

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1230

Del.quantity 1000 : 97.0...99.0

1000 : (95.0...101.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 44...52

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.50

Speed rpm : 1270...1275  
2nd rack travel in: 4.00  
Speed rpm : 1295...1310  
3rd rack travel in: 4.00  
Speed rpm : 1301...1315  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70  
5th rack travel in: 1276...1280  
Speed rpm : 10.50

Remarks:

:

#### LOW IDLE 1

Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 750  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 750  
Rack travel in mm : 4.90...5.10

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 85.0...89.0  
1000 s: (83.0...91.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 1270...1275

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 88.0...98.0  
1000 s: (85.0...101.0)

#### LOW IDLE

Speed rpm : 750  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 66

Edition : 31.03.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 476 070

## Injection pump

Pump designation : PES6MW100/720RS1172

EP type number : 0 413 406 155

Governor

Governor design. : RSV350...1300MW0A329  
-4

Governor no. : 0 420 085 116

## Customer-spec. information

Customer : DB-NKW

Engine : OM 366 LA

1st version kW : 170.0

Rated speed : 2600

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 015

### Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 19.00...21.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 10.4...10.6

100 s: (10.2...10.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 1000

Del.quantity : 104.0...106.0

1000 : (102.0...108.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 56...64

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.40

Speed rpm : 1330...1340

2nd rack travel in: 4.00

Speed rpm : 1410...1440  
4th rack travel in: 1500  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack trave: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.70...11.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 12.60...12.80  
2nd pressure hPa : 500  
Rack travel in m: 13.70...13.90  
3rd pressure hPa : 1000  
Rack travel in m: 14.40...14.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 98.0...101.0  
1000 s: (95.5...103.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 42.0...44.0  
1000 s: (40.0...46.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (6.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1330...1340

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

#### Remarks:

:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : BAO 13,2 B1  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 546 019

## Injection pump

Pump designation : PE6MW100/320RS1174  
 EP type number : 0 413 506 106  
 Governor  
 Governor design. : RQV325...1500MW101  
 Governor no. : 0 420 083 167

## Customer-spec. information

Customer : BAUDOUIN

Engine : 6 F 11 SRE

1st version kW : 206.0  
 Rated speed : 3000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.45...3.55  
 : (3.40...3.60)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 3- 6- 5- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1500

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 11.9...12.1

100 s: (11.7...12.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 7.0...7.2

Del.quantity cm<sup>3</sup>/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1650

travel mm : 9.40...9.80

2nd speed rpm : 1550

travel mm : 8.50...8.70

3rd speed rpm : 600

travel mm : 2.50...3.10

4th speed rpm : 325

travel mm : 1.00...1.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1500

Aneroid pressure h: 700

Del.quantity : 119.0...121.0

1000 : (117.0...123.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 52...60

Testing:

1st rack travel in: 10.10

Speed rpm : 1540...1550  
2nd rack travel in: 4.00  
Speed rpm : 1625...1655  
4th rack travel in: 1750  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack trave: 8.50  
Speed rpm : 325  
Rack travel in mm : 7.00...7.20

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1500  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 800  
Rack travel in m: 11.90...12.00  
3rd speed rpm : 1000  
Rack travel in m: 11.30...11.50

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 500  
Rack travel mm : 11.30...11.40

Measurement  
Speed 1/min : 500

1st pressure hPa : 700  
Rack travel in m: 11.90...12.00  
2nd pressure hPa : 600  
Rack travel in m: 11.50...11.60

#### START CUT-OUT

Speed 1/min : 230 (250)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 128.5...131.5  
1000 s: (126.0...134.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 109.0...111.0  
1000 s: (107.0...113.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1540...1550

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 105.0...115.0  
1000 s: (102.0...118.0)

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 7.00...7.20  
Del.quantity cm<sup>3</sup>/ : 8.0...12.0  
1000 s: (5.5...14.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 13,4 E

Edition : 14.04.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 548 022

## Injection pump

Pump designation : PE8MW100/720LS1149

EP type number : 0 413 508 105

## Governor

Governor design. : RQV300...1150MW75-1

Governor no. : 0 420 083 151

## Customer-spec. information

Customer : KHD

Engine : F 8L 513

1st version kW : 188.0

Rated speed : 2300

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 740 014

### Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

## (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20

: (3.05...3.25)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
4- 3

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 10.6...10.8

100 s: (10.4...11.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.3...7.4

Del.quantity cm3/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1200

travel mm : 8.40...8.60

2nd speed rpm : 1275

travel mm : 9.10...9.50

3rd speed rpm : 650

travel mm : 4.00...4.60

4th speed rpm : 300

travel mm : 1.00...1.40

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 106.0...108.0

: (104.0...110.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 50...58

Testing:

1st rack travel in: 10.40  
Speed rpm : 1190...1200  
2nd rack travel in: 4.50  
Speed rpm : 1260...1290  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.3

Testing:

Speed rpm : 100  
Minimum rack trave: 9.50  
Speed rpm : 300  
Rack travel in mm : 7.30...7.40

CONSTANT REGULATION

Speed rpm : 320...420

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 650  
Rack travel in m: 11.80...11.90  
3rd speed rpm : 900  
Rack travel in m: 11.60...11.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 650  
Del.quantity cm3/ : 106.0...108.0  
1000 s: (104.0...110.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.40  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...150.0  
1000 s: (137.0...153.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.30...7.40  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (9.0...17.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 13,4d13  
 Edition : 11.03.88  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 548 026

Injection pump  
 Pump designation : PE8MW100/720LS1128  
 EP type number : 0 413 508 103  
 Governor  
 Governor design. : RQ300...1150MW63~4  
 Governor no. : 0 420 082 031

## Customer-spec. information

Customer : KHD

Engine : BF 8L 513

1st version kW : 243.0  
 Rated speed : 2300  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20  
 : (3.05...3.25)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 14.4...14.6

100 s: (14.2...14.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del.quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.1...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1280

travel mm : 9.00...9.80

2nd speed rpm : 1150

travel mm : 6.60...6.80

3rd speed rpm : 650

travel mm : 5.80...6.20

4th speed rpm : 300

travel mm : 1.20...2.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 800

Del.quantity : 144.0...146.0

1000 : (142.0...148.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

### 1st version

#### Control lever

position degrees: 30...38

#### Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

#### Testing:

1st rack travel in: 11.90

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1265...1295

4th rack travel in: 1380

Speed rpm : 0.00...1.00

## LOW IDLE 1

### Control lever

position degrees: 8...16

#### Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.6

#### Testing:

Speed rpm : 100

Minimum rack trave: 8.20

Speed rpm : 300

Rack travel in mm : 6.50...6.70

## CONSTANT REGULATION

Speed rpm : 320...400

## TORQUE CONTROL

### Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 12.90...13.00

2nd speed rpm : 650

Rack travel in m: 13.60...13.70

3rd speed rpm : 850

Rack travel in m: 13.20...13.40

## Aneroid/Altitude

### Compensator Test

### 1st version

#### Setting

Speed rpm : 500

Pressure hPa : 480

Rack travel mm : 13.00...1310

## Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 11.70...11.80

2nd pressure hPa : 370

Rack travel in m: 12.10...12.40

3rd pressure hPa : 800

Rack travel in m: 13.60...13.70

## START CUT-OUT

Speed 1/min : 220 (250)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 800

Speed rpm : 650

Del.quantity cm3/ : 151.0...153.0

1000 s: (149.0...155.0)

Spread cm3 : 5.00

1000 s: (7.00)

Aneroid pressure h: -

Speed rpm : 450

Del.quantity cm3/ : 107.0...109.0

1000 s: (105.0...111.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 11.90

Speed rpm : 1190...1200

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 140.0...150.0

1000 s: (137.0...153.0)

## LOW IDLE

Speed rpm : 300

Rack travel in mm : 6.50...6.70

Del.quantity cm3/ : 13.0...17.0

1000 s: (11.0...19.0)

Spread cm3 : 3.50

1000 s: (5.50)

## Remarks:

:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 13.4 F  
 Edition : 28.11.88  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 548 027  
 Injection pump  
 Pump designation : PE8MW100/720LS1173  
 EP type number : 0 413 508 108  
 Governor  
 Governor design. : RQV300...1150MW99  
 Governor no. : 0 420 083 163

## Customer-spec. information

Customer : KHD  
 Engine : F8L513

1st version kW : 188.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 740 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20  
 : (3.05...3.25)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 11.20...11.30  
 Del.quantity cm3/ : 10.3...10.5  
 100 s: (10.1...10.7)  
 Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.0...5.2  
 Del.quantity cm3/ : 1.1...1.5  
 100 s: (0.8...1.7)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## (B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL  
 1st speed rpm : 1280  
 travel mm : 11.10...11.50  
 2nd speed rpm : 1190  
 travel mm : 10.10...10.30  
 3rd speed rpm : 400  
 travel mm : 2.90...3.50  
 4th speed rpm : 300  
 travel mm : 2.20...2.60

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1200  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Del.quantity : 103.0...105.0  
 1000 : (101.0...107.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 45...53

Testing:

1st rack travel in: 10.20  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1370  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.1

Testing:

Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 300  
Rack travel in mm : 5.00...5.20

TORQUE CONTROL

Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 650  
Rack travel in m: 11.80...11.90  
3rd speed rpm : 900  
Rack travel in m: 11.50...11.70

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 650  
Del.quantity cm3/ : 105.5...108.5  
1000 s: (103.0...111.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...150.0  
1000 s: (137.0...153.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.20  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 13,4D15  
 Edition : 07.02.89  
 Replaces : 11.11.88  
 Test oil : ISO-4113

Combination no. : 0 403 548 031

Injection pump  
 Pump designation : PE8MW100/720LS1118  
 EP type number : 0 413 508 102  
 Governor  
 Governor design. : RQ300/1150MW63-5  
 Governor no. : 0 420 082 035

## Customer-spec. information

Customer : KHD

Engine : BF8L513

1st version kW : 243.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20  
 : (3.05...3.25)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 14.1...14.3

100 s: (13.9...14.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.9...7.1

Del.quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.1...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1280  
 travel mm : 9.30...9.70

2nd speed rpm : 1200  
 travel mm : 6.80...7.00

3rd speed rpm : 380  
 travel mm : 4.10...4.70

4th speed rpm : 300  
 travel mm : 1.90...2.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 1150

Aneroid pressure h: 1000

Del.quantity : 141.0...143.0  
 1000 : (139.0...145.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 28...36

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.90  
Speed rpm : 1190...1205  
2nd rack travel in: 4.00  
Speed rpm : 1275...1305  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 8...16  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.0

Testing:

Speed rpm : 100  
Minimum rack trave: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.90...7.10

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 650  
Rack travel in m: 13.60...13.70  
3rd speed rpm : 850  
Rack travel in m: 13.00...13.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.80...11.90

Measurement

Speed 1/min : 500

1st pressure hPa : 380  
Rack travel in m: 12.20...12.50  
2nd pressure hPa : 480  
Rack travel in m: 13.10...13.20  
3rd pressure hPa : 1000  
Rack travel in m: 13.50...13.60

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ 1000 s: 146.5...149.5  
1000 s: (144.0...152.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 450  
Del.quantity cm<sup>3</sup>/ 1000 s: 107.0...109.0  
1000 s: (105.0...111.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1190...1205

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ 1000 s: 140.0...150.0  
1000 s: (137.0...153.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.90...7.10  
Del.quantity cm<sup>3</sup>/ 1000 s: 13.0...17.0  
1000 s: (11.0...19.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

TEST SHEET PUMP TEST SPECIFICATIONS	Starting order	1-10-7-2-6-5	
None	None	1-4-3	
None	None	1-4-3	
Test sheet	100-13-13		
Edition	07.02.99	Blasting	1-10-10-15-180-25-
Replaces	1		20-35
Test oil	ISO-4173	Tolerance + -	0.50 (0.75)
Combination no.	0 403 513 032	BASIC SETTING	
Injection pump		1st speed	rpm : 1150
Pump designation	0500101200M173	2nd speed	rpm : _____
EE type number	0 403 503 033	Back travel in mm	11.20, 11.30
Governor		3rd speed	rpm : _____
Governor design	020001100001-2	Det. quantity cm <sup>3</sup>	10.3, 10.5
Governor no.	0 420 020 036	4th speed	rpm : _____
Customer spec. information		100 s : (10.1, 10.7)	
Customer	100	Spread	cm <sup>3</sup> : 0.3
Engine	100-513	100 s : (0.6)	
1st version rpm	1000	2nd speed	rpm : 300.0
Rated speed	2500	Back travel	mm : 6.9, 5.1
TEST SHEET REQUIREMENTS		Det. quantity cm <sup>3</sup>	1.1, 1.5
Customer		100 s : (0.8, 1.7)	
Customer		Spread	cm <sup>3</sup> : 0.3
Test oil		100 s : (0.5)	
inlet temp. °C	30-40	(a) Setting of injection pump	
Overflow valve		With governor	
Test lines	1 000 710 014	GUIDE SLEEVE POSITION	
Customer		1st speed	rpm : 120
Customer		2nd speed	rpm : 120
Customer		3rd speed	rpm : 120
Customer		4th speed	rpm : 120
Customer		travel mm	3.50, 4.10
Customer		5th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		6th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		7th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		8th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		9th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		10th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		11th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		12th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		13th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		14th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		15th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		16th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		17th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		18th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		19th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		20th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		21st speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		22nd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		23rd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		24th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		25th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		26th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		27th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		28th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		29th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		30th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		31st speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		32nd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		33rd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		34th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		35th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		36th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		37th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		38th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		39th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		40th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		41st speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		42nd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		43rd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		44th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		45th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		46th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		47th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		48th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		49th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		50th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		51st speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		52nd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		53rd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		54th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		55th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		56th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		57th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		58th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		59th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		60th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		61st speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		62nd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		63rd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		64th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		65th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		66th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		67th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		68th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		69th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		70th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		71st speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		72nd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		73rd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		74th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		75th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		76th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		77th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		78th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		79th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		80th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		81st speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		82nd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		83rd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		84th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		85th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		86th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		87th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		88th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		89th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		90th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		91st speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		92nd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		93rd speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		94th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		95th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		96th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		97th speed	rpm : 300
Customer		travel mm	1.50, 1.90
Customer		98th speed	rpm :

1st version  
Control lever  
position degrees: 26...34

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.20  
Speed rpm : 1190...1205  
2nd rack travel in: 4.00  
Speed rpm : 1245...1275  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 8...16  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack trave: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 650  
Rack travel in m: 11.80...11.90  
3rd speed rpm : 900  
Rack travel in m: 11.50...11.80

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 105.5...108.5  
1000 s: (103.0...111.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20

Speed rpm : 1190...1205

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...150.0  
1000 s: (137.0...153.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 13,4 F2  
 Edition : 31.03.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 548 033  
 Injection pump  
 Pump designation : PE8MW100/720LS1173  
 EP type number : 0 413 508 108  
 Governor  
 Governor design. : RQV450...1150MW70-1  
 Governor no. : 0 420 083 179  
 Customer-spec. information  
 Customer : KHD  
 Engine : F8L513  
 1st version kW : 159.0  
 Rated speed : 2300  
**TEST BENCH REQUIREMENTS**  
 Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 740 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600  
**(A) Injection pump setting values**  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_  
**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32  
 Prestroke mm : 3.10...3.20  
 : (3.05...3.25)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3  
 Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
**BASIC SETTING**  
 1st speed rpm : 1150  
 Rack travel in mm : 10.20...10.30  
 Del.quantity cm<sup>3</sup>/ : 9.1...9.3  
 100 s: (8.9...9.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 450.0  
 Rack travel in mm : 4.8...5.0  
 Del.quantity cm<sup>3</sup>/ : 1.1...1.5  
 100 s: (0.8...1.7)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)  
**(B) Setting of injection pump  
 with governor**  
**GUIDE SLEEVE TRAVEL**  
 1st speed rpm : 1230  
 travel mm : 9.50...9.90  
 2nd speed rpm : 1190  
 travel mm : 8.90...9.10  
 3rd speed rpm : 650  
 travel mm : 2.80...3.40  
 4th speed rpm : 450  
 travel mm : 1.20...1.60  
**GUIDE SLEEVE POSITION**  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 15.20...17.80  
**FULL LOAD DELIV. AT FULL LOAD STOP**  
 1st version  
 Speed rpm : 1150  
 Del.quantity : 91.0...93.0  
 1000 : (89.0...95.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)  
**RATED SPEED**

1st version  
Control lever  
position degrees: 51...59

Testing:

1st rack travel in: 9.20  
Speed rpm : 1180...1190  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1320  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 4.9

Testing:

Speed rpm : 100  
Minimum rack trave: 6.50  
Speed rpm : 450  
Rack travel in mm : 4.80...5.00

TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 950  
Rack travel in m: 10.60...10.70  
3rd speed rpm : 1050  
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 370 (390)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 950  
Del.quantity cm3/ : 92.5...95.5  
1000 s: (90.0...98.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 1180...1190

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...150.0  
1000 s: (137.0...153.0)

LOW IDLE

Speed rpm : 450  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 5.7 v13  
 Edition : 02.05.89  
 Replaces : 9.85  
 Test oil : ISO-4113

Combination no. : 9 400 085 222

Injection pump  
 Pump designation : PES6A90D410RS2596  
 EP type number : 0 410 896 073  
 Governor  
 Governor design. : RQV300...1400AB1196L  
 Governor no. : 9 420 080 175

Customer-spec. information  
 Customer : DAIMLER-BENZ BRASIL

Engine : OM352A

1st version kW : 125.3  
 Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 12.40...12.50

Del.quantity cm<sup>3</sup>/ : 7.1...7.2

100 s: (6.9...7.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 300.0

Rack travel in mm : 9.4...9.6

Del.quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.1...1.9)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1400

Aneroid pressure h: 700

Del.quantity : 71.5...72.5

1000 : (69.5...74.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:

1st rack travel in: 11.40  
Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1570...1600  
4th rack travel in: 1750  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 26...34

Testing:

Speed rpm : 100  
Minimum rack trave: 11.00  
Speed rpm : 300  
Rack travel in mm : 9.40...9.60  
Rack travel in mm : 2.00  
Speed rpm : 610...670

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 600  
Rack travel in m: 13.80...13.90  
3rd speed rpm : 900  
Rack travel in m: 13.30...13.50  
4th speed rpm : 1100  
Rack travel in m: 12.80...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.60...12.70  
2nd pressure hPa : 300  
Rack travel in m: 13.50...13.60  
3rd pressure hPa : 240  
Rack travel in m: 12.80...13.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ 1000 s: 71.0...73.0  
1000 s: (68.5...75.5)  
Aneroid pressure h: 700  
Speed rpm : 900  
Del.quantity cm3/ 1000 s: 72.0...74.0  
1000 s: (69.5...76.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ 1000 s: 56.0...57.0  
1000 s: (54.0...59.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ 1000 s: 73.0...83.0  
1000 s: (70.0...86.0)  
Rack travel in mm : 15.60...16.00

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4.0 d  
 Edition : 02.05.89  
 Replaces : 24.7.87  
 Test oil : ISO-4113

Combination no. : 9 400 085 289

Injection pump  
 Pump designation : PES4A90D410RS2729  
 EP type number : 9 400 084 009  
 Governor  
 Governor design. : RQV300...1300AB1228L  
 Governor no. : 9 420 080 231

Customer-spec. information  
 Customer : DAIMLER-BENZ BRASIL

Engine : OM364A

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 8.4...8.5

100 s: (8.2...8.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 300.0

Rack travel in mm : 8.9...9.1

Del.quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.5...1.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1380

travel mm : 8.50...8.60

2nd speed rpm : 300

travel mm : 0.90...1.30

3rd speed rpm : 500

travel mm : 2.20...2.60

4th speed rpm : 900

travel mm : 4.90...5.10

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 84.5...85.5

1000 : (82.5...87.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control lever  
 position degrees: 61...69

**Testing:**

1st rack travel in: 12.70  
 Speed rpm : 1340...1350  
 2nd rack travel in: 4.00  
 Speed rpm : 1475...1505  
 4th rack travel in: 1600  
 Speed rpm : 0.00...1.00

**LOW IDLE 1**

Control lever  
 position degrees: 18...26

**Testing:**

Speed rpm : 100  
 Minimum rack trave: 10.20  
 Speed rpm : 300  
 Rack travel in mm : 8.60...8.80

**CONSTANT REGULATION**

Speed rpm : 540...680

**TORQUE CONTROL**

Torque control curve - 1st version  
 1st speed rpm : 1300  
 Rack travel in m: 13.70...13.80  
 2nd speed rpm : 500  
 Rack travel in m: 15.20...15.30  
 3rd speed rpm : 850  
 Rack travel in m: 14.80...15.00  
 4th speed rpm : 1000  
 Rack travel in m: 14.30...14.60

**Aneroid/Altitude  
 Compensator Test****1st version**

Setting  
 Speed rpm : 500  
 Pressure hPa : 700  
 Rack travel mm : 15.20...15.30

**Measurement**

Speed 1/min : 500

1st pressure hPa : -  
 Rack travel in m: 13.50...13.60  
 2nd pressure hPa : 570  
 Rack travel in m: 14.80...14.90  
 3rd pressure hPa : 500  
 Rack travel in m: 13.90...14.10

**START CUT-OUT**

Speed 1/min : 240 (260)

**FUEL DELIVERY CHARACTERISTICS****1st version**

Aneroid pressure h: 700  
 Speed rpm : 500  
 Del.quantity cm<sup>3</sup>/ 1000 s: 81.0...83.0  
 (78.5...85.5)  
 Aneroid pressure h: 700  
 Speed rpm : 850  
 Del.quantity cm<sup>3</sup>/ 1000 s: 88.0...90.0  
 (84.5...92.5)  
 Aneroid pressure h: -  
 Speed rpm : 500  
 Del.quantity cm<sup>3</sup>/ 1000 s: 64.0...66.0  
 (61.5...68.5)

**BREAKAWAY**

1st version  
 1mm rack travel less than

full load rack tr: 12.70  
 Speed rpm : 1340...1350

**STARTING FUEL DELIVERY**

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ 1000 s: 78.0...88.0  
 (75.0...91.0)  
 Rack travel in mm : 16.00...17.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEZ 6,1 a  
 Edition : 02.05.89  
 Replaces : 21.5.87  
 Test oil : ISO-4113

Combination no. : 9 400 085 293

Injection pump  
 Pump designation : PES6A80D410RS2527  
 EP type number : 9 400 093 005  
 Governor  
 Governor design. : RQV300...1400AB1234L  
 Governer no. : 9 420 080 241

## Customer-spec. information

Customer : DEUTZ ARGENTINA

Engine : F 6 L 913

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 6.9...7.0

100 s: (6.7...7.1)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

2nd speed rpm : 300.0

Rack travel in mm : 8.4...8.6

Del.quantity cm<sup>3</sup>/ : 0.8...1.1

100 s: (0.7...1.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1460

travel mm : 8.40...8.60

2nd speed rpm : 300

travel mm : 0.70...1.20

3rd speed rpm : 550

travel mm : 2.70...3.00

4th speed rpm : 775

travel mm : 4.10...4.60

5th speed rpm : 950

travel mm : 5.20...5.50

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1420

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1400

Del.quantity : 69.0...70.0

1000 : (67.5...71.5)

Spread cm<sup>3</sup> : 2.50

1000 : (4.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:

1st rack travel in: 11.00  
Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1570...1600  
4th rack travel in: 17.00  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 6...14

Testing:

Speed rpm : 100  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 540...600

CONSTANT REGULATION

Speed rpm : 400...500

TORQUE CONTROL

Dimension a mm : 0.90  
Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 500  
Rack travel in m: 12.90...13.00  
3rd speed rpm : 1000  
Rack travel in m: 12.70...12.90  
4th speed rpm : 1200  
Rack travel in m: 12.20...12.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 63.0...65.0  
1000 s: (61.0...67.0)  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 67.0...69.0  
1000 s: (65.0...71.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1440...1450

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 a 8  
 Edition : 02.05.89  
 Replaces : 1.9.88  
 Test oil : ISO-4113

Combination no. : 9 400 085 295

Injection pump  
 Pump designation : PES4A90D410RS2666  
 EP type number : 0 410 894 029  
 Governor  
 Governor design. : RQV300...1400AB1065-  
 5L  
 Governer no. : 0 420 212 169

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM364

1st version kW : 66.0  
 Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
 : (2.20...2.40)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 10.90...11.00

Del.quantity cm<sup>3</sup>/ : 6.3...6.4

100 s: (6.1...6.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 300.0

Rack travel in mm : 8.6...8.8

Del.quantity cm<sup>3</sup>/ : 0.8...1.2

100 s: (0.6...1.4)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1400

Del.quantity : 63.0...64.0

1000 : (61.0...66.0)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 58...66

## Testing:

1st rack travel in: 9.90

Speed rpm : 1450...1460  
2nd rack travel in: 4.00  
Speed rpm : 1560...1590  
4th rack travel in: 17.00  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 20...28

Testing:  
Speed rpm : 100  
Minimum rack trave: 10.20  
Speed rpm : 300  
Rack travel in mm : 8.60...8.80

CONSTANT REGULATION  
Speed rpm : 540...680

TORQUE CONTROL  
Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 630  
Rack travel in m: 12.20...12.30  
3rd speed rpm : 900  
Rack travel in m: 11.60...11.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 630  
Del.quantity cm<sup>3</sup>/ 1000 s: 55.5...58.5  
1000 s: (53.0...61.0)  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ 1000 s: 54.5...57.5  
1000 s: (52.0...60.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.90  
Speed rpm : 1450...1460

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ 1000 s: 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 17.00...17.40

Remarks:

Set shutoff stop to contact at  
3.0...3.5 mm control-rod travel.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MMM 5,9 j  
 Edition : 02.05.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 085 302

Injection pump  
 Pump designation : PES6A90D320RS2767  
 EP type number : 9 400 084 017  
 Governor  
 Governor design. : RSV300...1400AOB2207  
 -2R  
 Governer no. : 9 420 083 238

Customer-spec. information  
 Customer : MMM

Engine : TBD 229 EC6

1st version kW : 185.0  
 Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 046

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 14.30...14.40

Del.quantity cm³/ : 12.0...12.1

100 s: (11.8...12.3)

Spread cm³ : 0.3

100 s: (0.5)

2nd speed rpm : 300.0

Rack travel in mm : 7.9...8.1

Del.quantity cm³/ : 1.3...1.7

100 s: (1.1...1.9)

Spread cm³ : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 120.0...121.0

1000 : (118.0...123.0)

Spread cm³ : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control lever  
position degrees: 62...70

Testing:

1st rack travel in: 13.30  
Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1540...1570  
4th rack travel in: 1700  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 26...34  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.5

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 7.90...8.10  
Rack travel in mm : 2.00  
Speed rpm : 450...510

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 14.30...14.40  
2nd speed rpm : 500  
Rack travel in m: 14.30...14.50  
5th speed rpm : 350  
Rack travel in m: 15.50...16.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 106.5...108.5  
1000 s: (104.0...111.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1440...1450

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.90...8.10  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (11.0...19.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (4.50)

Remarks:

APPLICATION :

Navy

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FOR 6,6 f 2

Edition : 02.05.89

Replaces : -

Test oil : ISO-4113

Combination no. : 9 400 085 303

## Injection pump

Pump designation : PES6A95D410RS2714

EP type number : 9 400 084 001

Governor

Governor design. : RQV375...1300AB1208-  
3L

Governer no. : 9 420 080 263

## Customer-spec. information

Customer : FORD (FTO)

Engine : 6,6 TC

1st version kW : 127.0

Rated speed : 2600

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

### Test nozzle holder

assembly : 0 681 343 009

### Opening

pressure, bar : 172...175

Test Lines : 1 680 750 008

### Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.15...3.25  
: (3.10...3.30)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.90

& maximum rack tra: 21.00

Difference ° CS : 2.00...3.00

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 375.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1345

travel mm : 8.50...8.60

2nd speed rpm : 350

travel mm : 1.30...1.60

3rd speed rpm : 700

travel mm : 4.10...4.50

4th speed rpm : 1100

travel mm : 6.30...6.60

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1345

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del.quantity : 86.0...88.0  
 1000 : (84.0...90.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

#### RATED SPEED

1st version  
 Control lever  
 position degrees: 59...67

#### Testing:

1st rack travel in: 11.10  
 Speed rpm : 1340...1350  
 2nd rack travel in: 4.00  
 Speed rpm : 1450...1480  
 4th rack travel in: 1600  
 Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
 position degrees: 12...20

#### Testing:

Speed rpm : 100  
 Minimum rack trave: 9.50  
 Speed rpm : 375  
 Rack travel in mm : 6.40...6.60  
 Rack travel in mm : 2.00  
 Speed rpm : 650...710

#### CONSTANT REGULATION

Speed rpm : 460...530

#### TORQUE CONTROL

Dimension a mm : 0.40  
 Torque control curve - 1st version  
 1st speed rpm : 1300  
 Rack travel in m: 12.10...12.20  
 2nd speed rpm : 850  
 Rack travel in m: 12.50...12.60  
 4th speed rpm : 1000  
 Rack travel in m: 12.30...12.40

#### Aneroid/Altitude Compensator Test

1st version  
 Setting  
 Speed rpm : 500  
 Pressure hPa : 700  
 Rack travel mm : 12.50...12.60

Measurement  
 Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 11.10...11.20  
 2nd pressure hPa : 510  
 Rack travel in m: 12.20...12.30  
 3rd pressure hPa : 420  
 Rack travel in m: 11.40...11.60

#### START CUT-OUT

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
 Aneroid pressure h: 700  
 Speed rpm : 850  
 Del.quantity cm<sup>3</sup>/ : 85.0...88.0  
 1000 s: (82.5...90.5)  
 Aneroid pressure h: -  
 Speed rpm : 500  
 Del.quantity cm<sup>3</sup>/ : 61.0...63.0  
 1000 s: (59.0...65.0)

#### BREAKAWAY

1st version  
 1mm rack travel less than  
 full load rack tr: 11.10  
 Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 115.0...129.0  
 1000 s: (-)  
 Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 375  
 Rack travel in mm : 6.40...6.60  
 Del.quantity cm<sup>3</sup>/ : 7.0...11.0  
 1000 s: (4.5...13.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 s: (5.50)

#### Remarks:

:  
 Set shutoff stop 1.5...2.0 mm before shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FOR 6,6 m

Edition : 02.05.89

Replaces : -

Test oil : ISO-4113

Combination no. : 9 400 085 304

## Injection pump

Pump designation : PES6A95D412RS2709

EP type number : 9 400 083 099

Governor

Governor design. : RQV350...1400AB1202-  
3L

Governer no. : 9 420 080 262

## Customer-spec. information

Customer : FORD (FTO)

Engine : 6.6 L NA

1st version kW : 108.0

Rated speed : 2800

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.15...3.25  
: (3.10...3.30)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00

Difference ° CS : 2.00...3.00

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 7.4...7.6

100 s: (7.2...7.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.6...6.8

Del.quantity cm<sup>3</sup>/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1420  
travel mm : 8.50...8.60

2nd speed rpm : 350  
travel mm : 1.30...1.60

3rd speed rpm : 700  
travel mm : 4.20...4.60

4th speed rpm : 1100  
travel mm : 6.10...6.40

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1420

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400  
Del.quantity : 74.0...76.0  
1000 : (72.0...78.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...65

#### Testing:

1st rack travel in: 9.40  
Speed rpm : 1450...1460  
2nd rack travel in: 4.00  
Speed rpm : 1540...1570  
4th rack travel in: 1720  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 10...18

#### Testing:

Speed rpm : 100  
Minimum rack trave: 9.00  
Speed rpm : 350  
Rack travel in mm : 6.60...6.80  
Rack travel in mm : 2.00  
Speed rpm : 560...620

#### CONSTANT REGULATION

Speed rpm : 460...530

#### START CUT-OUT

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 63.0...66.0  
1000 s: (60.5...68.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1450...1460

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 112.0...126.0

1000 s: (-)

Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.60...6.80  
Del.quantity cm<sup>3</sup>/ : 8.0...12.0  
1000 s: (5.5...14.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:  
Set shutoff stop 1.5...2.0 mm before  
shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 5,7 v 22

Edition : 02.05.89

Replaces : -

Test oil : ISO-4113

Combination no. : 9 400 085 306

## Injection pump

Pump designation : PES6A90D410RS2596

EP type number : 0 410 896 073

## Governor

Governor design. : RQV300...1400AB1066-  
7L

Governer no. : 9 420 214 267

## Customer-spec. information

Customer : DAIMLER-BENZ BRASIL

Engine : OM352A

1st version kW : 121.0

Rated speed : 2800

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 12.40...12.50

Del.quantity cm<sup>3</sup>/ : 7.7...7.8

100 s: (7.5...8.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.4)

2nd speed rpm : 300.0

Rack travel in mm : 8.9...9.1

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1400

Aneroid pressure h: 700

Del.quantity : 77.5...78.5

1000 : (75.5...80.5)

Spread cm<sup>3</sup> : 3.00

1000 : (4.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:  
1st rack travel in: 11.50  
Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1570...1610  
4th rack travel in: 1750  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 67...75

Testing:  
Speed rpm : 100  
Minimum rack trave: 10.30  
Speed rpm : 300  
Rack travel in mm : 8.90...9.10

CONSTANT REGULATION  
Speed rpm : 560...680

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 500  
Rack travel in m: 13.20...13.30  
4th speed rpm : 1000  
Rack travel in m: 12.70...12.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 13.20...13.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.30...12.40  
2nd pressure hPa : 465  
Rack travel in m: 12.90...13.00  
3rd pressure hPa : 375  
Rack travel in m: 12.50...12.70

START CUT-OUT

Speed 1/min : 220 (240)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 500  
Del.quantity cm3/ 1000 s: 65.5...67.5 (64.5...68.5)  
Aneroid pressure h: 700  
Speed rpm : 1000  
Del.quantity cm3/ 1000 s: 74.5...78.5 (73.0...80.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ 1000 s: 56.5...58.5 (54.5...60.5)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 1440...1450

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ 1000 s: 71.0...81.0 (68.0...84.0)  
Rack travel in mm : 15.80...16.20

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 8.90...9.10  
Del.quantity cm3/ 1000 s: 9.0...15.0 (7.0...17.0)  
Spread cm3 : 2.00  
1000 s: (4.00)

Remarks:

Set shutoff stop to contact at  
3.0...3.5 mm control-rod travel.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 10,0 e 2  
 Edition : 02.05.89  
 Replaces : 1.9.88  
 Test oil : ISO-4113

Combination no. : 9 400 087 308

Injection pump  
 Pump designation : PE5P110A720RS479  
 EP type number : 9 400 087 040  
 Governor  
 Governor design. : RQ300/1050PA718-1  
 Governer no. : 9 420 080 187

Customer-spec. information  
 Customer : DAIMLER-BENZ BRASIL

Engine : OM355-5 A

1st version kW : 170.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 004

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.35...3.45  
 : (3.30...3.50)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/

100 s: (15.8...16.6)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/

100 s: (-)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 700

Del.quantity : 161.0...163.0

1000 : (158.0...166.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

## Testing:

1st rack travel in: 11.20

Speed rpm : 1095...1110

2nd rack travel in: 4.00

Speed rpm : 1150...1180

4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 375...415

TORQUE CONTROL  
Dimension a mm : 0.35  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 600  
Rack travel in m: 13.10...13.20  
3rd speed rpm : 900  
Rack travel in m: 12.70...13.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 13.10...13.20

Measurement  
Speed 1/min : 500  
1st pressure hPa : -  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 400  
Rack travel in m: 12.40...12.50  
3rd pressure hPa : 250  
Rack travel in m: 11.10...11.30

START CUT-OUT

Speed 1/min : 230 (270)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 177.0...181.0  
1000 s: (174.0...184.0)  
Aneroid pressure h: 700  
Speed rpm : 900

Del.quantity cm3/ : 174.0...178.0  
1000 s: (171.0...181.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 112.5...115.5  
1000 s: (110.0...118.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...170.0  
1000 s: (-)  
Rack travel in mm : 13.30...14.30

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 10,0 s4

Edition : 02.05.89

Replaces : -

Test oil : ISO-4113

Combination no. : 9 400 087 346

## Injection pump

Pump designation : PE6P120A320RS3186

EP type number : 0 411 826 756

## Governor

Governor design. : RQV250...1025PA657-1  
3

Governer no. : 0 421 813 592

## Customer-spec. information

Customer : VOLVO

Engine : TD 102 F

1st version kW : 220.0

Rated speed : 2050

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

### Test nozzle holder

assembly : 1 688 901 019

### Opening

pressure, bar : 207...210

### Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

### Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X1000

## (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.60...2.70  
: (2.55...2.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.40...11.50

Del.quantity cm<sup>3</sup>/ : 19.7...19.9

100 s: (19.4...20.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 3.9...4.1

Del.quantity cm<sup>3</sup>/ : 1.7...2.2

100 s: (1.4...2.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.7)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.10...1.30

2nd speed rpm : 500

travel mm : 4.10...4.90

3rd speed rpm : 700

travel mm : 6.30...6.70

4th speed rpm : 900

travel mm : 6.30...6.70

5th speed rpm : 1025

travel mm : 7.30...7.80

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1080

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1000  
Del.quantity : 197.0...199.0  
1000 : (194.0...202.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 58...66

#### Testing:

1st rack travel in: 10.40  
Speed rpm : 1055...1065  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 4...12

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.40  
Speed rpm : 250  
Rack travel in mm : 3.90...4.10

#### CONSTANT REGULATION

Speed rpm : 250...350

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.40...11.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 80  
Rack travel in m: 9.00...9.10  
3rd pressure hPa : 400  
Rack travel in m: 10.90...11.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700

Del.quantity cm<sup>3</sup>/ : 143.0...145.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.40  
Speed rpm : 1055...1065

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 3.90...4.10  
Del.quantity cm<sup>3</sup>/ : 17.0...22.0  
1000 s: (14.5...24.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

#### Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 12.2 a2  
 Edition : 02.05.89

Replaces : -

Test oil : ISO-4113

Combination no. : 9 400 087 357

## Injection pump

Pump designation : PE6P120A320RS3178

EP type number : 0 411 826 752

## Governor

Governor design. : RQV250...1025PA657-1

Governor no. : 0 421 813 567

## Customer-spec. information

Customer : VOLVO

Engine : TD 122 FS

1st version kW : 287.0

Rated speed : 2050

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

### Test nozzle holder

assembly : 1 688 901 019

### Opening

pressure, bar : 207...210

### Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

### Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X1000

## (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70

: (3.55...3.75)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 25.2...25.4

100 s: (24.9...25.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.8...5.1

Del.quantity cm<sup>3</sup>/ : 1.8...2.3

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.7)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.10...1.30

2nd speed rpm : 500

travel mm : 4.10...4.90

3rd speed rpm : 700

travel mm : 6.30...6.70

4th speed rpm : 900

travel mm : 6.30...6.70

5th speed rpm : 1025

travel mm : 7.30...7.80

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1090

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1200

Del.quantity : 252.0...254.0  
1000 : (249.0...257.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 61...69

#### Testing:

1st rack travel in: 13.00  
Speed rpm : 1055...1065  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 6...14

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.40  
Speed rpm : 250  
Rack travel in mm : 4.80...5.10

#### CONSTANT REGULATION

Speed rpm : 250...400

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.00...14.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 100  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 810  
Rack travel in m: 13.60...13.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 163.0...165.0  
1000 s: (160.0...168.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1055...1065

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.80...5.10  
Del.quantity cm<sup>3</sup>/ : 18.0...23.0  
1000 s: (15.5...25.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

#### Remarks:

:  
Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 14,2 j

Edition : 02.05.89

Replaces :

Test oil : ISO-4113

Combination no. : 9 400 087 372

## Injection pump

Pump designation : PE8P120A920/4LS7002T

EP type number : 9 400 087 054

## Governor

Governor design. : RQV200...1000PA547-2

Governer no. : 9 420 080 238

## Customer-spec. information

Customer : SAAB-SCANIA

Engine : DSC 14 07

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

### Test nozzle holder

assembly : 1 688 901 019

### Opening

pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

### Outside diameter

× Wall thickness

× Length mm : 6.00X1.50X600

## (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
6- 8

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.20...13.30

Del.quantity cm<sup>3</sup>/ : 18.7...18.9

100 s: (18.4...19.2)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.9...5.1

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (-)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1040

travel mm : 8.40...8.50

2nd speed rpm : 225

travel mm : 1.00...1.60

3rd speed rpm : 350

travel mm : 2.50...2.90

4th speed rpm : 650

travel mm : 4.60...4.90

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1000

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 600

Del.quantity : -187.0...189.0

1000 : (184.0...192.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

## RATED SPEED

### 1st version

#### Control lever

position degrees: 56...64

#### Testing:

1st rack travel in: 12.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

## LOW IDLE 1

### Control lever

position degrees: 6...14

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.90  
Speed rpm : 225  
Rack travel in mm : 4.40...4.60  
Rack travel in mm : 2.00  
Speed rpm : 310...370

## Aneroid/Altitude Compensator Test

### 1st version

#### Setting

Speed rpm : 500  
Pressure hPa : 600  
Rack travel mm : 13.20...13.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.30...11.40  
2nd pressure hPa : 355  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 260  
Rack travel in m: 11.80...12.00

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 600  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 183.0...191.0  
1000 s: (181.0...193.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 137.0...141.0  
1000 s: (135.0...143.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 1040...1050

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)

Rack travel in mm : 20.00...21.00

#### Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 b 7  
 Edition : 20.12.88  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 230 103

Injection pump  
 Pump designation : PES6A100D410RS2691-2  
 EP type number : 9 410 230 028  
 Governor  
 Governor design. : RQV350...1100AB1227R  
 Governer no. : 9 420 231 015

## Customer-spec. information

Customer : C.D.C.

Engine : 6 CT 8.3

1st version kW : 156.6  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.80...12.90

Del.quantity cm<sup>3</sup>/ : 13.0...13.2

100 s: (12.8...13.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 1.8...2.2

100 s: (1.5...2.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1100  
 travel mm : 7.70...7.70  
 2nd speed rpm : 1150  
 travel mm : 8.00...8.60  
 3rd speed rpm : 1290  
 travel mm : 9.50...10.10  
 4th speed rpm : 350  
 travel mm : 1.20...1.60  
 5th speed rpm : 600  
 travel mm : 3.90...4.50

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1290

Rack travel in mm : 6.70...9.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 130.5...132.5  
1000 : (128.5...134.5)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 60...68

#### Testing:

1st rack travel in: 11.80  
Speed rpm : 1150...1160  
2nd rack travel in: 4.00  
Speed rpm : 1265...1295  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 9...17

#### Testing:

Speed rpm : 250  
Minimum rack trave: 8.00  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 420...480

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.80...12.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.10...10.30  
2nd pressure hPa : 535  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 390  
Rack travel in m: 10.70...11.10

#### START CUT-OUT

Speed 1/min : 260 (280)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/s : 79.0...83.0  
1000 s: (77.0...85.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1150...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/s : 165.0...185.0  
1000 s: (160.0...190.0)

Rack travel in mm : 15.30...15.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/s : 18.0...22.0  
1000 s: (15.5...24.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks: : CDC # 3912645

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark is at 7° after  
start of delivery.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a19

Edition : 20.12.88

Replaces : -

Test oil : ISO-4113

Combination no. : 9 400 230 109

## Injection pump

Pump designation : PES6A100D320/3RS2691

EP type number : 9 410 230 030

## Governor

Governor design. : RSV450...1100A2C2190  
-21R

Governer no. : 9 420 234 164

## Customer-spec. information

Customer : C.D.C.

Engine : 6CT830

1st version kW : 117.1

Rated speed : 2200

## TEST BENCH REQUIREMENTS

### Test oil

inlet temp. °C : 38...42

### Overflow valve

: 1 417 413 047

Inlet press., bar : 1.50

### Test nozzle holder

assembly : 1 688 901 017

### Opening

pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test Lines : 1 680 750 014

### Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

### (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.20...10.30

Del.quantity cm<sup>3</sup>/ : 8.9...9.1

100 s: (8.7...9.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.7...5.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 89.0...91.0

1000 : (87.0...93.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 47...55

Testing:

1st rack travel in: 9.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 29...37  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.3

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 450  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 2.00  
Speed rpm : 525...585

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 750  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 90.5...94.5  
1000 s: (88.5...96.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.70...5.90

Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks: : C.D.C. # 3911541

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a18  
 Edition : 20.12.88  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 230 110

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 -4

EP type number : 9 410 230 030

Governor

Governor design. : RSV450...1100AOC2190  
 -22R

Governor no. : 9 420 234 173

## Customer-spec. information

Customer : C.D.C.

Engine : 6CT830

1st version kW : 150.6

Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 11.8...12.0

100 s: (11.6...12.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.7...5.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 118.5...120.5

1000 : (116.5...122.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:  
1st rack travel in: 11.10  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.3

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 450  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 2.00  
Speed rpm : 500...560

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 750  
Rack travel in m: 13.20...13.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 750  
Del.quantity cm3/ : 133.0...137.0  
1000 s: (131.0...139.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.10  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.70...5.90

Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: C.D.C. # 3911542

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Limit shutoff stop screw to 1.0 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a17  
 Edition : 20.12.88  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 230 111

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 -4  
 EP type number : 9 410 230 030  
 Governor  
 Governor design. : RSV450...1100AOC2190  
 -23R  
 Governer no. : 9 420 234 174

## Customer-spec. information

Customer : C.D.C.

Engine : 6CT830

1st version kW : 134.2  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.20...11.30

Del.quantity cm<sup>3</sup>/

100 s: (9.9...10.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.7...5.9

Del.quantity cm<sup>3</sup>/

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 49...57

Testing:  
1st rack travel in: 10.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
3rd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 31...39  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.3

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 450  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 2.00  
Speed rpm : 535...595

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 750  
Rack travel in m: 12.00...12.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 110.5...114.5  
1000 s: (108.5...116.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 450

Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks: : C.D.C. # 3911545

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Limit shutoff stop screw to 1.0 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 10,1 a9  
 Edition : 07.04.89  
 Replaces : 5.3.87  
 Test oil : ISO-4113

Combination no. : 9 400 231 039

Injection pump  
 Pump designation : PES6P110A720RS370  
 EP type number : 0 412 016 052  
 Governor  
 Governor design. : RSV450...1050P0A465  
 Governor no. : 9 420 234 180

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6619A

1st version kW : 201.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x3.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.40...12.50

Del.quantity cm<sup>3</sup>/

100 s: (17.1...17.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 450.0

Rack travel in mm : 6.0...6.2

Del.quantity cm<sup>3</sup>/

100 s: (1.7...2.7)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 900

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 47...55

Testing:

1st rack travel in: 11.40

Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1220...1250  
4th rack travel in: 1250  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 25...33  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 450  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.00  
Speed rpm : 600...660

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 650  
Rack travel in m: 13.60...13.80

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.50...10.70  
2nd pressure hPa : 280  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 480  
Rack travel in m: 12.80...13.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 650  
Del.quantity cm3/ : 198.5...201.5  
1000 s: (195.0...205.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : -  
1000 s: (123.0...133.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (165.0...215.0)  
Rack travel in mm : 20.00...21.00

#### HIGH IDLE

1st version  
Speed rpm : 1170  
Rack travel in mm : 7.40...7.60

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (17.0...27.0)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks: : JOHN DEERE # RE29146

Starting/full-load transition speed  
from holding magnet = 400 1/min.

Start-of-delivery mark at control-rod  
travel 10.5 mm and 15° after start of  
delivery.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 3,9 K  
 Edition : 10.03.89  
 replaces : 08.77  
 Calibrating oil : ISO 4113

Injection pump : VA 4/100H1200 CR187  
 Type number : 0 460 304 232

Customer-specific information  
 Customer : IHC

Engine : D 239

## TEST BENCH REQUIREMENTS

Inlet press., bar : 0,2

Calibrating nozzle-holder  
 assembly : 1 688 901 020

Opening  
 pressure bar : 172...175

Perforated-plate  
 diameter mm : 0,6

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,5  
 (from BDC): +0,02(0,04)

Indicator setting:  
 Piston stroke mm: 1.0  
 Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
 Setting value mm: 3,6...4,6

Supply-pump pressure:

Speed 1/min: 900  
 Setting value bar: 4,7...5,2

Full-load del. w/out charge press.:

Speed 1/min : 800  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 70,0...71,0  
 Dispersion cm<sup>3</sup>/ : 2,5  
 1000H.: -

Low-idle speed regulation:

Speed 1/min: 350  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 12,0...18,0  
 Dispersion cm<sup>3</sup>/ : 3,0  
 1000H.: -

Full-load speed regulation:

Speed 1/min: 1300  
 Del.quantity cm<sup>3</sup>/  
 1000H: 24,0...32,0

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 85,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
 TD travel mm: 1,3...2,3  
 mm: (1,0...2,6)  
 2nd speed 1/min: 900  
 TD travel mm: 3,6...4,6  
 mm: (3,3...4,9)  
 3rd speed 1/min: 1000  
 TD travel mm: 4,7...5,4  
 mm: (4,4...5,7)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
 Supply-pump  
 pressure bar: 1,4...1,9  
 bar: (1,2...2,1)  
 2nd speed 1/min: 900  
 Supply-pump  
 pressure bar: 4,7...5,2  
 bar: (4,5...5,4)  
 3rd speed 1/min: 1200  
 Supply-pump  
 pressure bar: 5,7...6,2  
 bar: (5,5...6,4)

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 55...98  
quantity cm<sup>3</sup>/10s: (40...113)  
2nd speed 1/min: 1200  
Overflow : 55...98  
quantity cm<sup>3</sup>/10s: (40...113)

Governor-spring washer thickness  
Dimension V mm : 24,65

Remarks:

Delivery-quant. and breakaway char.:

1st speed 1/min: 1330  
1000H.: -  
2nd speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 24,0...32,0  
1000H.: (23,5...32,5)  
3rd speed 1/min: 1180  
Del.quantity cm<sup>3</sup>/: 74,0...77,0  
1000H.: (73,5...77,5)  
4th speed 1/min: 800  
Del.quantity cm<sup>3</sup>/: 70,0...71,0  
1000H.: (69,5...71,5)  
5th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 68,0...71,0  
1000H.: (67,5...71,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1200  
Del.quantity cm<sup>3</sup>/: -  
1000H.: -

Idle delivery:

1st speed 1/min: 350  
Del.quantity cm<sup>3</sup>/: 12,0..18,0  
1000H.: (10,0..20,0)  
2nd speed 1/min: 420  
Del.quantity cm<sup>3</sup>/: -  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250-

2nd speed 1/min: 350

Mounting and assembly dimensions:

Angles:

Alpha ° : 24+4°  
Beta ° : 40+8°  
Gamma ° : 30-8°  
Delta ° : 60+8°

Initial setting dimensions:

Dimension IV mm : 1,8

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## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 3,9 K11  
Edition : 10.03.89  
replaces : 08.77  
Calibrating oil : ISO 4113

Injection pump : VA 4/100H1200 CR187  
P  
Type number : 0 460 304 233

Customer-specific information  
Customer : IHC

Engine : D 239

### TEST BENCH REQUIREMENTS

Inlet press., bar : 0,2

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
pressure bar : 172...175

Perforated-plate  
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,5  
(from BDC): +0,02(0,04)

Indicator setting:

Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 3,6...4,6

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,7...5,2

Full-load del. w/out charge press.:

Speed 1/min : 800  
Del.quantity cm<sup>3</sup>/  
1000H.: 70,0...71,0  
Dispersion cm<sup>3</sup>/ : 2,5  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 350  
Del.quantity cm<sup>3</sup>/  
1000H.: 12,0...18,0  
Dispersion cm<sup>3</sup>/ : 3,0  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/  
1000H: 24,0...32,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 85,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,3...2,3  
mm: (1,0...2,6)  
2nd speed 1/min: 900  
TD travel mm: 3,6...4,6  
mm: (3,3...4,9)  
3rd speed 1/min: 1000  
TD travel mm: 4,7...5,4  
mm: (4,4...5,7)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 1,4...1,9  
bar: (1,2...2,1)  
2nd speed 1/min: 900  
Supply-pump pressure bar: 4,7...5,2  
bar: (4,5...5,4)  
3rd speed 1/min: 1200  
Supply-pump pressure bar: 5,7...6,2  
bar: (5,5...6,4)

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 55...98  
quantity cm<sup>3</sup>/10s: (40...113)  
2nd speed 1/min: 1200  
Overflow : 55...98  
quantity cm<sup>3</sup>/10s: (40...113)

Dimension IV mm : 1,8  
Governor-spring washer thickness  
Dimension V mm : 24,65

Remarks:

### Delivery-quant. and breakaway char.:

1st speed 1/min: 1330  
1000H.: -  
2nd speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 24,0...32,0  
1000H.: (23,5...32,5)  
3rd speed 1/min: 1180  
Del.quantity cm<sup>3</sup>/: 74,0...77,0  
1000H.: (73,5...77,5)  
4th speed 1/min: 800  
Del.quantity cm<sup>3</sup>/: 70,0...71,0  
1000H.: (69,5...71,5)  
5th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 68,0...71,0  
1000H.: (67,5...71,5)

### Zero delivery (stop):

### Mech. shutoff:

Speed 1/min: 1200  
Del.quantity cm<sup>3</sup>/: -  
1000H.: -

### Idle delivery:

1st speed 1/min: 350  
Del.quantity cm<sup>3</sup>/: 12,0..18,0  
1000H.: (10,0..20,0)  
2nd speed 1/min: 420  
Del.quantity cm<sup>3</sup>/: -  
1000H.: -

### Automatic starting fuel delivery:

1st speed 1/min: 250-

2nd speed 1/min: 350

### Mounting and assembly dimensions:

#### Angles:

Alpha	°	: 24+4°
Beta	°	: 40+8°
Gamma	°	: 30 -8°
Delta	°	: 60 +8°

### Initial setting dimensions:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 5,8 P1  
 Edition : 10.03.89  
 replaces : 05.79  
 Calibrating oil : ISO 4113

Injection pump : VA 6/10H1150 CR191-1  
 Type number : 0 460 306 238

Customer-specific information  
 Customer : IHC

Engine : D 358

## TEST BENCH REQUIREMENTS

Inlet press., bar : 0,2

Calibrating nozzle-holder  
 assembly : 1 688 901 020

Opening  
 pressure bar : 172...175

Perforated-plate  
 diameter mm : 0,6

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,4  
 (from BDC): +0,02(0,04)

Indicator setting:  
 Piston stroke mm: 1,0  
 Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
 Setting value mm: 4,0...4,8

Supply-pump pressure:

Speed 1/min: 900  
 Setting value bar: 5,4...5,9

Full-load del. w/out charge press.:

Speed 1/min : 800  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 71,5...72,5  
 Dispersion cm<sup>3</sup>/ : 2,5  
 1000H.: -

Low-idle speed regulation:

Speed 1/min: 450  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 8,0...14,0  
 Dispersion cm<sup>3</sup>/ : 3,0  
 1000H.: -

Full-load speed regulation:

Speed 1/min: 1200  
 Del.quantity cm<sup>3</sup>/  
 1000H: 29,0...35,0

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
 TD travel mm: 0,8...1,8  
 2nd speed 1/min: 900  
 TD travel mm: 4,0...4,8  
 3rd speed 1/min: 1050  
 TD travel mm: 4,7...5,4

Supply-pump pressure characteristic:

1st speed 1/min: 200  
 Supply-pump  
 pressure bar: 1,9...2,4  
 bar: (1,7...2,6)  
 2nd speed 1/min: 900  
 Supply-pump  
 pressure bar: 5,4...5,9  
 bar: (5,2...6,1)  
 3rd speed 1/min: 1150  
 Supply-pump  
 pressure bar: 6,2...6,7  
 bar: (6,0...6,9)

Overflow quantity at overflow valve:

1st speed 1/min: 500

Overflow : 55...98  
quantity cm<sup>3</sup>/10s: (40...113)  
2nd speed 1/min: 1150  
Overflow : 55...98  
quantity cm<sup>3</sup>/10s: (40...113)

Remarks:

Delivery-quant. and breakaway char.:

1st speed 1/min: 1280  
1000H.: -  
2nd speed 1/min: 1200  
Del.quantity cm<sup>3</sup>/: 29,0...35,0  
1000H.: (28,0...36,0)  
3rd speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 68,5...71,5  
1000H.: (67,5...72,5)  
4th speed 1/min: 800  
Del.quantity cm<sup>3</sup>/: 71,5...72,5  
1000H.: (70,5...73,5)  
5th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 72,0...75,0  
1000H.: (71,0...76,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: -  
1000H.: -

Idle delivery:

1st speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 8,0...14,0  
1000H.: (6,0...16,0)  
2nd speed 1/min: 530  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250-

2nd speed 1/min: 360

Mounting and assembly dimensions:

Angles:  
Alpha ° : 25+4°  
Beta ° : 46+8°  
Gamma ° : 30 -8°  
Delta ° : 60 +8°

Initial setting dimensions:

Dimension IV mm : 2,4  
Governor-spring washer thickness  
Dimension V mm : 24,65

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 5,8 P3  
 Edition : 10.03.89  
 replaces : 05.79  
 Calibrating oil : ISO 4113

Injection pump : VA 6/10H1150 CR191-1

P  
 Type number : 0 460 306 239

Customer-specific information  
 Customer : IHC

Engine : D 358

### TEST BENCH REQUIREMENTS

Inlet press., bar : 0,2

Calibrating nozzle-holder  
 assembly : 1 688 901 020

Opening  
 pressure bar : 172...175

Perforated-plate  
 diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,4  
 (from BDC) : +0,02(0,04)

Indicator setting:  
 Piston stroke mm: 1.0  
 Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
 Setting value mm: 4,0...4,8

Supply-pump pressure:

Speed 1/min: 900  
 Setting value bar: 5,4...5,9

Full-load del. w/out charge press.:

Speed 1/min : 800  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 71,5...72,5  
 Dispersion cm<sup>3</sup>/ : 2,5  
 1000H.: -

Low-idle speed regulation:

Speed 1/min: 450  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 8,0...14,0  
 Dispersion cm<sup>3</sup>/ : 3,0  
 1000H.: -

Full-load speed regulation:

Speed 1/min: 1200  
 Del.quantity cm<sup>3</sup>/  
 1000H: 29,0...35,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
 TD travel mm: 0,8...1,8  
 2nd speed 1/min: 900  
 TD travel mm: 4,0...4,8  
 3rd speed 1/min: 1050  
 TD travel mm: 4,7...5,4

Supply-pump pressure characteristic:

1st speed 1/min: 200  
 Supply-pump pressure bar: 1,9...2,4  
 bar: (1,7...2,6)  
 2nd speed 1/min: 900  
 Supply-pump pressure bar: 5,4...5,9  
 bar: (5,2...6,1)  
 3rd speed 1/min: 1150  
 Supply-pump pressure bar: 6,2...6,7  
 bar: (6,0...6,9)

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow : 55...98  
 quantity cm<sup>3</sup>/10s: (40...113)  
 2nd speed 1/min: 1150  
 Overflow : 55...98  
 quantity cm<sup>3</sup>/10s: (40...113)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1280  
1000H.: -  
2nd speed 1/min: 1200  
Del.quantity cm<sup>3</sup>/: 29,0...35,0  
1000H.: (28,0...36,0)  
3rd speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 68,5...71,5  
1000H.: (67,5...72,5)  
4th speed 1/min: 800  
Del.quantity cm<sup>3</sup>/: 71,5...72,5  
1000H.: (70,5...73,5)  
5th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 72,0...75,0  
1000H.: (71,0...76,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: -  
1000H.: -

Idle delivery:

1st speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 8,0...14,0  
1000H.: (6,0...16,0)  
2nd speed 1/min: 530  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250-

2nd speed 1/min: 360

Mounting and assembly dimensions:

Angles:

Alpha	° : 25+4°
Beta	° : 46+8°
Gamma	° : 30 -8°
Delta	° : 60 +8°

Initial setting dimensions:

Dimension IV mm : 2,4  
Governor-spring washer thickness  
Dimension V mm : 24,65

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 1,5 E  
 Edition : 11.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 4/10F2100 L353  
 Type number : 0 460 403 013

Customer-specific information  
 Customer : VM

Engine : HR 392 SHJ

## TEST BENCH REQUIREMENTS

Calibrating oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 000

Opening  
 pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,4  
 (from BDC) : +0,02(0,04)

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000  
 Charge press. hPa: 1000  
 Setting value mm: 2,1...2,5

Supply-pump pressure:

Speed 1/min: 1000  
 Charge press. hPa: 1000  
 Setting value bar: 4,2...4,8

Full-load del. with charge press.:

Speed 1/min: 1500  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 65,0...66,0  
 Dispersion cm<sup>3</sup>/ : 3,0  
 1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 750  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 46,1...47,1

Low-idle speed regulation:

Speed 1/min: 460  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 9,5...13,5

Full-load speed regulation:

Speed 1/min: 2300  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/  
 1000H: 34,0...40,0

Start:

Speed 1/min: 100  
 Charge press. hPa: -  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 35,0

Load-dependent start of delivery:

Speed 1/min: 1500  
 Charge press. hPa: 1000

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
 Charge press. hPa: 1000  
 TD travel mm: 2,1...2,5  
 mm: (1,6...3,0)  
 2nd speed 1/min: 1500  
 Charge press. hPa: 1000  
 TD travel mm: 3,9...4,7  
 mm: (3,6...5,0)  
 3rd speed 1/min: 1900  
 Charge press. hPa: 1000  
 TD travel mm: 5,4...6,2  
 mm: (5,1...6,5)  
 4th speed 1/min: 2100

Charge press. hPa: 1000  
 TD travel mm: 6,1...6,9  
                   mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
 Charge press. hPa: -  
 Supply-pump pressure bar: 2,3...2,9  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4,2...4,8  
 3rd speed 1/min: 2100  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7,9...8,5

Overflow quantity at overflow valve:

1st speed 1/min: 600  
 Charge press. hPa: -  
 Overflow : 41...83  
 quantity cm<sup>3</sup>/10s: (26...98)  
 2nd speed 1/min: 2100  
 Charge press. hPa: 1000  
 Overflow : 55...138  
 quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750  
 Charge-air pressure-setting point hPa: 350  
 LDA stroke mm: -  
 Del.quantity cm<sup>3</sup>: 55,5...56,5  
                   1000H.: (53,5...58,5)  
 2nd speed 1/min: 2500  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>: 0,0...6,0  
                   1000H.: -  
 3rd speed 1/min: 2300  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>: 34,0...40,0  
                   1000H.: (33,0...41,0)  
 4th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>: 55,2...57,6  
                   1000H.: (54,2...58,8)  
 5th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>: 65,0...66,0  
                   1000H.: (63,5...67,5)  
 6th speed 1/min: 750  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>: 60,5...63,5  
                   1000H.: (59,5...64,5)  
 7th speed 1/min: 750  
 Charge press. hPa: -

Del.quantity cm<sup>3</sup>: 46,1...47,1  
                   1000H.: (44,1...48,1)  
 8th speed 1/min: 750  
 Charge press. hPa: 350  
 Del.quantity cm<sup>3</sup>: 55,5...56,5  
                   1000H.: (53,5...58,5)  
 9th speed 1/min: 600  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>: 42,0...44,0  
                   1000H.: (40,0...46,0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 460  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>: 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 460  
 Del.quantity cm<sup>3</sup>: 9,5...13,5  
                   1000H.: (7,5...15,5)  
 2nd speed 1/min: 500  
 Del.quantity cm<sup>3</sup>: 3,5...9,5  
                   1000H.: (1,5...11,5)  
 3rd speed 1/min: 600  
 Del.quantity cm<sup>3</sup>: 0,0...3,0  
                   1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 350  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>: -  
 ind. 1000H: 42,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation	
K	mm : -
KF	mm : 5,6...6,0
MS	mm : 0,6...1,0
XK	mm : 20,0...22,0
XL	mm : 9,9...13,3

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

Correction at adjusting nut (46)



L02

## BOSCH-INV.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,2 K  
 Edition : 11.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 4/10F1600 L352  
 Type number : 0 460 404 061

Customer-specific information  
 Customer : VM

Engine : HR 494

Power k: 53

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 000

Opening  
 pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200  
 Setting value mm: 1,9...2,3

Supply-pump pressure:

Speed 1/min: 1200  
 Setting value bar: 4,8...5,4

Full-load del. w/out charge press.:

Speed 1/min : 1200  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 44,5...45,5  
 Dispersion cm<sup>3</sup>/ : 3,5  
 1000H.: -

Low-idle speed regulation:

Speed 1/min: 400  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 11,5...15,5

Full-load speed regulation:

Speed 1/min: 1650  
 Del.quantity cm<sup>3</sup>/  
 1000H: 27,0...33,0

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 45,0

Load-dependent start of delivery:

Speed 1/min: 1200

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 1000
TD travel	mm: 0,7...1,5
	mm: (0,4...1,8)
2nd speed	1/min: 1200
TD travel	mm: 1,9...2,3
	mm: (1,4...2,8)
3rd speed	1/min: 1600
TD travel	mm: 3,6...4,4
	mm: (3,3...4,7)

Supply-pump pressure characteristic:

1st speed	1/min: 600
Supply-pump pressure	bar: 2,4...3,0
2nd speed	1/min: 1200
Supply-pump pressure	bar: 4,8...5,4
3rd speed	1/min: 1600
Supply-pump pressure	bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1600  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1700  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1650  
Del.quantity cm<sup>3</sup>/: 27,0...33,0  
1000H.: (24,0...36,0)  
3rd speed 1/min: 1625  
Del.quantity cm<sup>3</sup>/: 33,5...41,5  
1000H.: -  
4th speed 1/min: 1600  
Del.quantity cm<sup>3</sup>/: 38,0...41,0  
1000H.: (36,5...42,5)  
5th speed 1/min: 1200  
Del.quantity cm<sup>3</sup>/: 44,5...45,5  
1000H.: (42,0...48,0)  
6th speed 1/min: 600  
Del.quantity cm<sup>3</sup>/: 43,5...46,5  
1000H.: (42,0...48,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1600  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 400  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400  
Del.quantity cm<sup>3</sup>/: 11,5..15,5  
1000H.: (9,5...17,5)  
2nd speed 1/min: 480  
Del.quantity cm<sup>3</sup>/: 2,0...8,0  
1000H.: (1,0...9,0)  
3rd speed 1/min: 550  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 50,0

2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation	mm	:	3,2...3,4
K	mm	:	-
KF	mm	:	0,6...1,0
MS	mm	:	-
SVS max.	mm	:	-
XK	mm	:	17,0...19,0
XL	mm	:	14,2...17,6

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 2,5 A  
 Edition : 09.05.89  
 replaces : 10.86  
 Calibrating oil : ISO 4113

Injection pump : VE 4/11F2000 R119  
 Type number : 0 460 414 007

Customer-specific information  
 Customer : FORD

Engine : YORK 84

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
 assembly : 1 688 901 023

Opening  
 pressure bar : 172...175

Perforated-plate  
 diameter mm : 0,4

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 450

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400  
 Setting value mm: 3,2...3,6  
 KSB solenoid-operated  
 valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1400  
 Setting value bar: 5,7...6,5  
 KSB solenoid-operated  
 valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 33,5...34,5 F  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>: 3,5  
 1000H.: (3,5)

Low-idle speed regulation:

Speed 1/min: 415  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 9,0...11,0  
 KSB solenoid-operated  
 valve volt: 12,0

Full-load speed regulation:

Speed 1/min: 2200  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 17,5...19,5  
 KSB solenoid-operated  
 valve volt: 12,0

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 80,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
 TD travel mm: 3,9...4,1 A  
 mm: -  
 2nd speed 1/min: 1250  
 TD travel mm: 4,5...6,5 B  
 mm: -  
 3rd speed 1/min: 1000  
 TD travel mm: 0,9...1,7  
 mm: (0,6...2,0)

KSB solenoid-operated  
 valve volt: 12,0  
 4th speed 1/min: 1200  
 TD travel mm: 1,8...2,6  
 mm: (1,5...2,9)  
 KSB solenoid-operated  
 valve volt: 12,0  
 5th speed 1/min: 1400

TD travel mm: 3,2...3,6  
mm: (2,7...4,1)

KSB solenoid-operated  
valve volt: 12,0

6th speed 1/min: 1650  
TD travel mm: 4,7...4,9

mm: (4,6...5,0)

KSB solenoid-operated  
valve volt: 12,0

1st speed 1/min: 1900  
TD travel mm: 6,9...8,1  
mm: (6,8...8,2)

Overflow quantity at overflow valve:

1st speed 1/min: 500  
KSB solenoid-operated  
valve volt: 12,0

Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)

2nd speed 1/min: 2000

KSB solenoid-operated  
valve volt: 12,0

Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1950  
HBA stroke mm: 10,0  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 40,0...42,0 D  
1000H.: (38,4...43,6) D

2nd speed 1/min: 2350

KSB solenoid-operated  
valve volt: 12,0

Del.quantity cm<sup>3</sup>/: 0,0...8,0  
1000H.: -

3rd speed 1/min: 2200

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 17,5...19,5  
1000H.: (14,0...23,0)

4th speed 1/min: 1000

KSB solenoid-operated  
valve volt: 12,0

Del.quantity cm<sup>3</sup>/: 39,5...40,5 E  
1000H.: (37,4...42,6) E

5th speed 1/min: 500

KSB solenoid-operated  
valve volt: 12,0

Del.quantity cm<sup>3</sup>/: 33,5...36,5 F  
1000H.: (31,6...38,4) F

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 415  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 415  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 9,0...11,0  
1000H.: (5,5...14,5)

2nd speed 1/min: 500

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 3,0...8,0  
1000H.: (1,0...10,0)

Automatic starting fuel delivery:

1st speed 1/min: 300  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 40,0

2nd speed 1/min: 480

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H: 38,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation	mm
K	: 3,2...3,4
KF	: K-0T
MS	: 1,7...1,9
SVS max.	: 4,7
XK	: 18,0...20,0
XL	: 10,4...13,8

Remarks:

Difference in supply pump pressure  
between 1900 min. -1 and  
1000 min. -1 = 2.4...2.8 bar.

Pump/engine assignment:

Attach timing-device cover KDEP 1151.

Plunger lift in blocking position =

0.71...

0.75 mm referenced to outlet "A".

Unscrew KSB ball valve 2 mm

F = Adjustment point for low full-load delivery

E = Fuel-delivery adjustment point in HBA range. (Correction by way of HBA adjusting screw).

D = Adjustment point for high full-load delivery

A = KSB adjustment point

B = KSB curve point

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 2,5 A1  
 Edition : 09.05.89  
 replaces : 10.86  
 Calibrating oil : ISO 4113

Injection pump : VE 4/11F2000 R119-1  
 Type number : 0 460 414 018

Customer-specific information  
 Customer : FORD

Engine : YORK 84

## TEST BENCH REQUIREMENTS

Calibrating oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
 assembly : 1 688 901 023

Opening  
 pressure bar : 172...175

Perforated-plate  
 diameter mm : 0,4

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 450

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400  
 Setting value mm: 3,2...3,6  
 KSB solenoid-operated  
 valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1400  
 Setting value bar: 5,7...6,5  
 KSB solenoid-operated  
 valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 33,5...34,5 F  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>: 3,5  
 1000H.: (3,5)

Low-idle speed regulation:

Speed 1/min: 415  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 9,0...11,0  
 KSB solenoid-operated  
 valve volt: 12,0

Full-load speed regulation:

Speed 1/min: 2200  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 17,5...19,5  
 KSB solenoid-operated  
 valve volt: 12,0

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 80,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
 TD travel mm: 3,9...4,1 A  
 mm: -  
 2nd speed 1/min: 1250  
 TD travel mm: 4,5...6,5 B  
 mm: -  
 3rd speed 1/min: 1000  
 TD travel mm: 0,9...1,7  
 mm: (0,6...2,0)

KSB solenoid-operated  
 valve volt: 12,0  
 4th speed 1/min: 1200  
 TD travel mm: 1,8...2,6  
 mm: (1,5...2,9)  
 KSB solenoid-operated  
 valve volt: 12,0  
 5th speed 1/min: 1400

TD travel mm: 3,2...3,6  
mm: (2,7...4,1)

KSB solenoid-operated valve volt: 12,0  
6th speed 1/min: 1650  
TD travel mm: 4,7...4,9  
mm: (4,6...5,0)

KSB solenoid-operated valve volt: 12,0

1st speed 1/min: 1900  
TD travel mm: 6,9...8,1  
mm: (6,8...8,2)

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
KSB solenoid-operated valve volt: 12,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2000  
KSB solenoid-operated valve volt: 12,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 1950  
HBA stroke mm: 10,0  
KSB solenoid-operated valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 40,0...42,0 D  
1000H.: (38,4...43,6) D  
2nd speed 1/min: 2350  
KSB solenoid-operated valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0,0...8,0  
1000H.: -  
3rd speed 1/min: 2200  
KSB solenoid-operated valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 17,5...19,5  
1000H.: (14,0...23,0)  
4th speed 1/min: 1000  
KSB solenoid-operated valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 39,5...40,5 E  
1000H.: (37,4...42,6) E  
5th speed 1/min: 500  
KSB solenoid-operated valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 33,5...36,5 F  
1000H.: (31,6...38,4) F

#### Zero delivery (stop):

#### Electr. shutoff:

Speed 1/min: 415  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

#### Idle delivery:

1st speed 1/min: 415  
KSB solenoid-operated valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 9,0...11,0  
1000H.: (5,5...14,5)  
2nd speed 1/min: 500  
KSB solenoid-operated valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 3,0...8,0  
1000H.: (1,0...10,0)

#### Automatic starting fuel delivery:

1st speed 1/min: 300  
KSB solenoid-operated valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 40,0

2nd speed 1/min: 480  
KSB solenoid-operated valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 38,0

#### Shutoff electromagnet:

Cut-in min. voltage : 10,0  
Rated voltage : 12,0

#### Mounting and assembly dimensions:

Designation	
K	mm : 3,2...3,4
KF	mm : K-0T
MS	mm : 1,7...1,9
SVS max.	mm : 4,7
XK	mm : 18,0...20,0
XL	mm : 10,4...13,8

#### Remarks:

Difference in supply pump pressure between 1900 min. -1 and 1000 min. -1 = 2.4...2.8 bar.

Pump/engine assignment:  
Attach timing-device cover KDEP 1151.  
Plunger lift in blocking position = 0.71...  
0.75 mm referenced to outlet "A".

Unscrew KSB ball valve 2 mm

F = Adjustment point for low full-load delivery

E = Fuel-delivery adjustment point in HBA range. (Correction by way of HBA adjusting screw).

D = Adjustment point for high full-load delivery

A = KSB adjustment point

B = KSB curve point

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 2,0 A  
 Edition : 09.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 4/11F2250 R228  
 Type number : 0 460 414 029

Customer-specific information  
 Customer : PERKINS

Engine : 4.20

### TEST BENCH REQUIREMENTS

Calibrating oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
 assembly : 1 688 901 022

Opening pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 450

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Start of delivery block  
 Piston stroke mm: 1,37  
 mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1800  
 Setting value mm: 3,1...3,5  
 KSB solenoid-operated  
 valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1800  
 Setting value bar: 6,2...6,8  
 KSB solenoid-operated  
 valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 19,0...20,0 F  
 KSB solenoid-operated  
 valve volt : 12,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H : -

Low-idle speed regulation:

Speed 1/min: 400  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 8,0...10,0  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 3,0  
 1000H.: -

Full-load speed regulation:

Speed 1/min: 2500  
 Del.quantity cm<sup>3</sup>/  
 1000H: 23,5...25,5  
 KSB solenoid-operated  
 valve volt: 12,0

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
 TD travel mm: 2,2...2,4 A  
 mm: (1,5...3,1) A  
 KSB solenoid-operated  
 valve volt: -  
 2nd speed 1/min: 1200  
 TD travel mm: 2,1...4,1 B  
 mm: (1,9...4,3) B  
 KSB solenoid-operated  
 valve volt: -  
 3rd speed 1/min: 1500  
 TD travel mm: 1,5...2,3  
 mm: (1,2...2,6)

KSB solenoid-operated  
 valve volt: 12,0  
 4th speed 1/min: 1800  
 TD travel mm: 3,1...3,5  
 mm: (2,6...4,0)  
 KSB solenoid-operated  
 valve volt: 12,0  
 5th speed 1/min: 2250  
 TD travel mm: 4,9...5,7  
 mm: (4,6...6,0)  
 KSB solenoid-operated  
 valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 1000  
 Supply-pump  
 pressure bar: 4,3...4,9  
 KSB solenoid-operated  
 valve volt: 12,0  
 2nd speed 1/min: 1800  
 Supply-pump  
 pressure bar: 6,2...6,8  
 KSB solenoid-operated  
 valve volt: 12,0  
 3rd speed 1/min: 2250  
 Supply-pump  
 pressure bar: 7,4...8,0  
 KSB solenoid-operated  
 valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 KSB solenoid-operated  
 valve volt: 12,0  
 Overflow : 41...83  
 quantity cm<sup>3</sup>/10s: (26...98)  
 2nd speed 1/min: 2250  
 KSB solenoid-operated  
 valve volt: 12,0  
 Overflow : 55...138  
 quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2250  
 HBA stroke mm: 10,4  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 57,5...62,5 D  
 1000H.: (57,4...62,6) D  
 2nd speed 1/min: 2600  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 0,0...15,0  
 1000H.: -  
 3rd speed 1/min: 2500  
 KSB solenoid-operated  
 valve volt: 12,0

Del.quantity cm<sup>3</sup>/: 23,5...25,5  
 1000H.: (26,0...29,0)  
 4th speed 1/min: 2250  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 57,5...62,5 D  
 1000H.: (57,4...62,6) D  
 5th speed 1/min: 1000  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 42,8...43,8 E  
 1000H.: (40,7...45,9) E  
 6th speed 1/min: 500  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 19,0...20,0 F  
 1000H.: (16,9...22,1) F

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 400  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 8,0...10,0  
 1000H.: (4,5...13,5)  
 2nd speed 1/min: 500  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 1,0...7,0  
 1000H.: (0,0...8,5)

Automatic starting fuel delivery:

2nd speed 1/min: 300  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: -  
 max. 1000H.: 40,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
 K mm : 3,2...3,4

KF	mm : K-OT
MS	mm : 1,1...1,5
SVS max.	mm : 6,0
XK	mm : 20,0...22,0
XL	mm : 10,4...13,8

Remarks:

A = KSB adjustment point

B = KSB curve point

F = Adjustment point for low full-load delivery

E = Fuel-delivery adjustment point in HBA range. (Correction by way of HBA adjusting screw).

D = Adjustment point for high full-load delivery

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 2,0 B  
 Edition : 09.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 4/11F2250 R229  
 Type number : 0 460 414 030

Customer-specific information  
 Customer : PERKINS

Engine : T 4.20

### TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
 assembly : 1 688 901 022

Opening  
 pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 450

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Start of delivery block  
 Piston stroke mm: 1,00  
 mm: +0,02(0,06)  
 Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
 Setting value mm: 3,0...3,4  
 KSB solenoid-operated  
 valve volt: -

Supply-pump pressure:

Speed 1/min: 1500  
 Charge press. hPa: 800  
 Setting value bar: 7,1...7,7  
 KSB solenoid-operated  
 valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 1250  
 Charge press. hPa: 800  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 66,5...67,5  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H.: -

Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 17,0...18,0  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H.: -

Low-idle speed regulation:

Speed 1/min: 400  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 10,0...12,0  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 3,0  
 1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 2500  
 Charge press. hPa: 800  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 23,5...25,5  
 KSB solenoid-operated  
 valve volt: 12,0

Start:

Speed 1/min: 100  
 Del.quantity : 60,0...100,0  
 mind cm<sup>3</sup>/1000H.: -  
 KSB solenoid-operated  
 valve volt: 12,0

Inspection-pump test specifications  
 Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 800  
 TD travel mm: 1,8...2,0 A  
 mm: (1,1...2,7) A  
 KSB solenoid-operated valve volt: -  
 2nd speed 1/min: 800  
 Charge press. hPa: 800  
 TD travel mm: 1,0...3,0 B  
 mm: (0,8...3,2) B  
 KSB solenoid-operated valve volt: -  
 3rd speed 1/min: 1000  
 Charge press. hPa: 800  
 TD travel mm: 0,6...1,4  
 mm: (0,3...1,7)  
 KSB solenoid-operated valve volt: 12,0  
 4th speed 1/min: 1500  
 Charge press. hPa: 800  
 TD travel mm: 3,0...3,4  
 mm: (2,6...3,8)  
 KSB solenoid-operated valve volt: 12,0  
 5th speed 1/min: 2000  
 Charge press. hPa: 800  
 TD travel mm: 5,8...6,6  
 mm: (5,5...6,9)  
 KSB solenoid-operated valve volt: 12,0

### Supply-pump pressure characteristic:

1st speed 1/min: 1000  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 6,1...6,7  
 KSB solenoid-operated valve volt: 12,0  
 2nd speed 1/min: 1500  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 7,1...7,7  
 KSB solenoid-operated valve volt: 12,0  
 3rd speed 1/min: 2000  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 8,1...8,7  
 KSB solenoid-operated valve volt: 12,0

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: 800

+ KSB solenoid-operated valve volt: 12,0  
 + Overflow quantity cm<sup>3</sup>/10s: (26...98)  
 + 2nd speed 1/min: 2250  
 + Charge press. hPa: 800  
 + KSB solenoid-operated valve volt: 12,0  
 + Overflow quantity cm<sup>3</sup>/10s: (26...153)  
 + Delivery-quant. and breakaway char.:  
 + 1st speed 1/min: 800  
 + Charge-air pressure-setting point hPa: 300  
 + LDA stroke mm: 6,5  
 + KSB solenoid-operated valve volt: 12,0  
 + Del.quantity cm<sup>3</sup>/: 34,7...35,7  
 + 1000H.: (31,7...38,7)  
 + 2nd speed 1/min: 2600  
 + Charge press. hPa: 800  
 + KSB solenoid-operated valve volt: 12,0  
 + Del.quantity cm<sup>3</sup>/: 0,0...10,0  
 + 1000H.: -  
 + 3rd speed 1/min: 2500  
 + Charge press. hPa: 800  
 + KSB solenoid-operated valve volt: 12,0  
 + Del.quantity cm<sup>3</sup>/: 23,5...25,5  
 + 1000H.: (20,5...28,5)  
 + 4th speed 1/min: 2250  
 + Charge press. hPa: 800  
 + KSB solenoid-operated valve volt: 12,0  
 + Del.quantity cm<sup>3</sup>/: 69,0...73,0  
 + 1000H.: (68,0...74,0)  
 + 5th speed 1/min: 1250  
 + Charge press. hPa: 800  
 + KSB solenoid-operated valve volt: 12,0  
 + Del.quantity cm<sup>3</sup>/: 66,5...67,5  
 + 1000H.: (64,5...69,5)  
 + 6th speed 1/min: 800  
 + Charge press. hPa: 300  
 + KSB solenoid-operated valve volt: 12,0  
 + Del.quantity cm<sup>3</sup>/: 34,7...35,7  
 + 1000H.: (31,7...38,7)  
 + 7th speed 1/min: 500  
 + Charge press. hPa: 800  
 + KSB solenoid-operated valve volt: 12,0  
 + Del.quantity cm<sup>3</sup>/: 59,5...65,5  
 + 1000H.: -  
 + 8th speed 1/min: 500  
 + KSB solenoid-operated valve volt: 12,0

Del. quantity cm<sup>3</sup>/: 17,0...18,0  
1000H: (14,5...20,5)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 400  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 10,0...12,0  
1000H.: (7,0...15,0)  
2nd speed 1/min: 500  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 2,0...8,0  
1000H.: (1,0...9,0)

Automatic starting fuel delivery:

2nd speed 1/min: 300  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
max. 1000H: 30,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4  
KF mm : K-OT  
MS mm : 0,35.0,75  
SVS max. mm : 4,3  
XK mm : 20,0...22,0  
XL mm : 9,6...13,0

Remarks:

A = KSB adjustment point

B = KSB curve point

Unscrew KSB ball valve 2 mm

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 2,5 B  
 Edition : 12.05.89  
 replaces : 13.01.89  
 Calibrating oil : ISO 4113  
 Injection pump : VE 4/11F2000 R288  
 Type number : 0 460 414 051

Customer-specific information  
 Customer : FORD

Engine : 2,5 DI

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
 assembly : 1 688 901 023

Opening  
 pressure bar : 172...175

Perforated-plate  
 diameter mm : 0,4

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 450

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Start of delivery block  
 Piston stroke mm: 0,78  
 mm: 0,73...0,83

Outlet : 8

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
 Setting value mm: 2,5...2,9

Supply-pump pressure:

Speed 1/min: 1250  
 Setting value bar: 5,6...6,2  
 Full-load del. w/out charge press.:  
 Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 30,5...31,5 F

Low-idle speed regulation:

Speed 1/min: 425  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 14,0...18,0

Full-load speed regulation:

Speed 1/min: 2100  
 Del.quantity cm<sup>3</sup>/  
 1000H: 29,5...33,5

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 62,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 800
TD travel	mm: 0,0...0,8
	mm: (0,0...1,1)
2nd speed	1/min: 1250
TD travel	mm: 2,5...2,9
	mm: (2,2...3,2)
3rd speed	1/min: 1950
TD travel	mm: 6,0...6,8
	mm: (5,7...7,1)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump pressure	bar: 3,1...3,7
2nd speed	1/min: 1000
Supply-pump pressure	bar: 4,8...5,4
3rd speed	1/min: 1250
Supply-pump pressure	bar: 5,6...6,2
4th speed	1/min: 1950
Supply-pump pressure	bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow : 41...83  
 quantity cm<sup>3</sup>/10s: (26...98)  
 2nd speed 1/min: 1950  
 Overflow : 55...138  
 quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1950  
 HBA stroke mm: 10,0  
 Del.quantity cm<sup>3</sup>/: 37,0...40,6 D  
 1000H.: (36,3...41,3) D  
 2nd speed 1/min: 2350  
 Del.quantity cm<sup>3</sup>/: 0,0...10,0  
 1000H.: -  
 3rd speed 1/min: 2200  
 Del.quantity cm<sup>3</sup>/: 17,0...25,0  
 1000H.: (15,0...27,0)  
 4th speed 1/min: 2100  
 Del.quantity cm<sup>3</sup>/: 29,5...33,5  
 1000H.: (26,5...36,5)  
 5th speed 1/min: 1950  
 Del.quantity cm<sup>3</sup>/: 37,0...40,6  
 1000H.: (36,3...41,3)  
 6th speed 1/min: 1700  
 Del.quantity cm<sup>3</sup>/: 36,7...40,3  
 1000H.: (36,0...41,0)  
 7th speed 1/min: 1000  
 Del.quantity cm<sup>3</sup>/: 33,8...34,8 E  
 1000H.: (31,8...36,8) E  
 8th speed 1/min: 500  
 Del.quantity cm<sup>3</sup>/: 30,5...31,5 F  
 1000H.: (26,0...36,0) F

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 425  
 Del.quantity cm<sup>3</sup>/: 14,0..18,0  
 1000H.: (12,0..20,0)  
 2nd speed 1/min: 500  
 Del.quantity cm<sup>3</sup>/: 7,5...15,5  
 1000H.: (5,5...17,5)

Automatic starting fuel delivery:

1st speed 1/min: 300

Del.quantity cm<sup>3</sup>/: -  
 ind. 1000H: 30,0

2nd speed 1/min: 480  
 Del.quantity cm<sup>3</sup>/: -  
 max. 1000H : 34,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
 K mm : 3,2...3,4  
 KF mm : K-OT  
 MS mm : 1,3...1,7  
 SVS max. mm : 3,8  
 XK mm : 17,0...19,0  
 XL mm : 10,9...14,5

Remarks:

Pump/engine assignment:  
 Stroke in blocking position 0.73...  
 0.83 mm, referenced to outlet "B".  
 Attach timing-device cover  
 KDEP 1151.

F = Adjustment point for low full-load  
 delivery

E = Fuel-delivery adjustment point in  
 HBA range. (Correction by way of HBA  
 adjusting screw).

D = Adjustment point for high full-  
 load delivery

Adjust part-load delivery:

Setting = 12.0 mm

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 2,5 C  
 Edition : 12.05.89  
 replaces : 13.01.89  
 Calibrating oil : ISO 4113  
  
 Injection pump : VE 4/11F2000 R288-1  
 Type number : 0 460 414 052  
  
 Customer-specific information  
 Customer : FORD  
  
 Engine : 2,5 DI

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
 assembly : 1 688 901 023

Opening  
 pressure bar : 172...175

Perforated-plate  
 diameter mm : 0,4

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 450

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Start of delivery block  
 Piston stroke mm: 0,78  
 mm: 0,73...0,83

Outlet : B

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
 Setting value mm: 2,5...2,9

Supply-pump pressure:

Speed 1/min: 1250  
 Setting value bar: 5,6...6,2  
  
 Full-load del. w/out charge press. :  
  
 Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 30,5...31,5 F  
  
 Low-idle speed regulation:  
  
 Speed 1/min: 425  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 16,0...20,0

Full-load speed regulation:

Speed 1/min: 2100  
 Del.quantity cm<sup>3</sup>/  
 1000H: 30,5...34,5  
 Dispersion cm<sup>3</sup>: 3,0  
 1000H.: (4,0)

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 62,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
 TD travel mm: 0,0...0,8  
 mm: (0,0...1,1)  
 2nd speed 1/min: 1250  
 TD travel mm: 2,5...2,9  
 mm: (2,2...3,2)  
 3rd speed 1/min: 1950  
 TD travel mm: 6,0...6,8  
 mm: (5,7...7,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Supply-pump pressure bar: 3,1...3,7  
 2nd speed 1/min: 1000  
 Supply-pump pressure bar: 4,8...5,4  
 3rd speed 1/min: 1250  
 Supply-pump pressure bar: 5,6...6,2  
 4th speed 1/min: 1950

Supply-pump  
pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1950  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1950  
HBA stroke mm: 10,0  
Del.quantity cm<sup>3</sup>: 37,0...40,6 D  
1000H.: (36,3...41,3) D  
2nd speed 1/min: 2350  
Del.quantity cm<sup>3</sup>: 0,0...10,0  
1000H.: -  
3rd speed 1/min: 2200  
Del.quantity cm<sup>3</sup>: 17,0...25,0  
1000H.: (15,0...27,0)  
4th speed 1/min: 2100  
Del.quantity cm<sup>3</sup>: 30,5...34,5  
1000H.: (27,5...37,5)  
5th speed 1/min: 1950  
Del.quantity cm<sup>3</sup>: 37,0...40,6  
1000H.: (36,3...41,3)  
6th speed 1/min: 1700  
Del.quantity cm<sup>3</sup>: 37,7...41,3  
1000H.: (37,0...42,0)  
7th speed 1/min: 1000  
Del.quantity cm<sup>3</sup>: 34,8...35,8 E  
1000H.: (32,8...37,8) E  
8th speed 1/min: 500  
Del.quantity cm<sup>3</sup>: 30,5...31,5 F  
1000H.: (26,0...36,0) F

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425  
ELAB volt: -  
Del.quantity cm<sup>3</sup>: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425  
Del.quantity cm<sup>3</sup>: 16,0..20,0  
1000H.: (14,0..22,0)  
2nd speed 1/min: 500  
Del.quantity cm<sup>3</sup>: 7,5...15,5  
1000H.: (5,5...17,5)

Arrangement of drivers on engine-

speed lever for exhaust-gas-  
recirculation valve linkage (guage)

1st speed 1/min: 1250  
Del.quantity cm<sup>3</sup>: 23,0..24,0  
1000H.: (21,0..26,0)

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del.quantity cm<sup>3</sup>: -  
ind. 1000H: 30,0

2nd speed 1/min: 480  
Del.quantity cm<sup>3</sup>: -  
max. 1000H: 34,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation	mm
K	: 3,2...3,4
KF	: K-0T
MS	: 1,3...1,7
SVS max.	: 3,8
XK	: 17,0...19,0
XL	: 10,9...14,5

Remarks:

Pump/engine assignment:  
Stroke in blocking position 0.73...  
0.83 mm, referenced to outlet "B".  
Attach timing-device cover  
KDEP 1151.

F = Adjustment point for low full-load  
delivery

E = Fuel-delivery adjustment point in  
HBA range. (Correction by way of HBA  
adjusting screw).

D = Adjustment point for high full-  
load delivery

Adjust part-load delivery:  
Setting = 12.0 mm

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 2,5 E  
 Edition : 12.05.89  
 replaces : 13.01.89  
 Calibrating oil : ISO 4113  
 Injection pump : VE 4/11F2000 R288-3  
 Type number : 0 460 414 062

Customer-specific information  
 Customer : FORD

Engine : 2,5 DI

## TEST BENCH REQUIREMENTS

Calibrating oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
 assembly : 1 688 901 023

Opening  
 pressure bar : 172...175

Perforated-plate  
 diameter mm : 0,4

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 450

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Start of delivery block  
 Piston stroke mm: 0,78  
 mm: 0,73...0,83

Outlet : B

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
 Setting value mm: 2,5...2,9

Supply-pump pressure:

Speed 1/min: 1250  
 Setting value bar: 5,6...6,2  
 Full-load del. w/out charge press.:  
 Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 30,5...31,5 F

Low-idle speed regulation:

Speed 1/min: 425  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 14,0...18,0

Full-load speed regulation:

Speed 1/min: 2100  
 Del.quantity cm<sup>3</sup>/  
 1000H: 29,5...33,5  
 Dispersion cm<sup>3</sup>/ : 3,0  
 1000H.: (4,0)

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 62,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
 TD travel mm: 0,0...0,8  
 mm: (0,0...1,1)  
 2nd speed 1/min: 1250  
 TD travel mm: 2,5...2,9  
 mm: (2,2...3,1)  
 3rd speed 1/min: 1950  
 TD travel mm: 6,0...6,8  
 mm: (5,7...7,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Supply-pump pressure bar: 3,1...3,7  
 2nd speed 1/min: 1000  
 Supply-pump pressure bar: 4,8...5,4  
 3rd speed 1/min: 1250  
 Supply-pump pressure bar: 5,6...6,2  
 4th speed 1/min: 1950

Supply-pump  
pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1950  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1950  
HBA stroke mm: 10,0  
Del.quantity cm<sup>3</sup>: 37,0...40,6 D  
1000H.: (36,3...41,3) D  
2nd speed 1/min: 2350  
Del.quantity cm<sup>3</sup>: 0,0...10,0  
1000H.: -  
3rd speed 1/min: 2200  
Del.quantity cm<sup>3</sup>: 17,0...25,0  
1000H.: (15,0...27,0)  
4th speed 1/min: 2100  
Del.quantity cm<sup>3</sup>: 29,5...33,5  
1000H.: (26,5...36,5)  
5th speed 1/min: 1950  
Del.quantity cm<sup>3</sup>: 37,0...40,6  
1000H.: (36,3...41,3)  
6th speed 1/min: 1700  
Del.quantity cm<sup>3</sup>: 36,7...40,3  
1000H.: (36,0...41,0)  
7th speed 1/min: 1000  
Del.quantity cm<sup>3</sup>: 33,8...34,8 E  
1000H.: (31,8...36,8) E  
8th speed 1/min: 500  
Del.quantity cm<sup>3</sup>: 30,5...31,5 F  
1000H.: (26,0...36,0) F

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425  
ELAB volt: -  
Del.quantity cm<sup>3</sup>: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425  
Del.quantity cm<sup>3</sup>: 14,0..18,0  
1000H.: (12,0..20,0)  
2nd speed 1/min: 500  
Del.quantity cm<sup>3</sup>: 7,5...15,5  
1000H.: (5,5...17,5)

Arrangement of drivers on engine-

speed lever for exhaust-gas-  
recirculation valve linkage (guage)

1st speed 1/min: 1250  
Del.quantity cm<sup>3</sup>: 23,0..24,0  
1000H.: (21,0..26,0)

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del.quantity cm<sup>3</sup>: -  
ind. 1000H: 30,0

2nd speed 1/min: 480  
Del.quantity cm<sup>3</sup>: -  
max. 1000H: 34,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: K-0T
MS	mm	: 1,3...1,7
SVS max.	mm	: 3,8
XK	mm	: 17,0...19,0
XL	mm	: 10,9...14,5

Remarks:

F = Adjustment point for low full-load  
delivery

E = Fuel-delivery adjustment point in  
HBA range. (Correction by way of HBA  
adjusting screw).

D = Adjustment point for high full-  
load delivery

Adjust part-load delivery:

Setting = 12.0 mm

Pump/engine assignment:

Stroke in blocking position 0.73...  
0.83 mm, referenced to outlet "B".

Attach timing-device cover  
KDEP 1151.

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF 2,5 P1  
Edition : 10.05.89  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/11F2000 R342  
Type number : 0 460 414 067

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8140.07.2700

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
Setting value mm: 3,1...3,5

Supply-pump pressure:

Speed 1/min: 1000  
Setting value bar: 5,7...6,3

Full-load del. w/out charge press.:

Speed 1/min : 525  
Del.quantity cm<sup>3</sup>/  
1000H.: 27,0...28,0

Low-idle speed regulation:

Speed 1/min: 350  
Del.quantity cm<sup>3</sup>/  
1000H.: 10,5...14,5

Full-load speed regulation:

Speed 1/min: 2300  
Del.quantity cm<sup>3</sup>/  
1000H.: 18,0...22,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 40,0

Load-dependent start of delivery:

Speed 1/min: 1100

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
TD travel mm: 0,6...1,4  
mm: (0,4...1,6)  
2nd speed 1/min: 1100  
TD travel mm: 3,1...3,5  
mm: (2,7...3,9)  
3rd speed 1/min: 1500  
TD travel mm: 4,1...4,9  
mm: (3,8...5,0)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 4,1...4,7  
2nd speed 1/min: 1100  
Supply-pump  
pressure bar: 5,7...6,3  
3rd speed 1/min: 1500  
Supply-pump  
pressure bar: 6,9...7,5

Overflow quantity at overflow valve:

1st speed 1/min: 525

Overflow quantity cm<sup>3</sup>/10s: 41...83  
 2nd speed 1/min: 2000  
 Overflow quantity cm<sup>3</sup>/10s: 55...138  
 (40...153)  
  
 Delivery-quant. and breakaway char.:  
 1st speed 1/min: 2450  
 Del.quantity cm<sup>3</sup>/: 0,0...5,0  
 1000H.: -  
 2nd speed 1/min: 2300  
 Del.quantity cm<sup>3</sup>/: 18,0...22,0  
 1000H.: (15,5...24,5)  
 3rd speed 1/min: 2200  
 Del.quantity cm<sup>3</sup>/: 32,0...40,0  
 1000H.: (31,5...40,5)  
 4th speed 1/min: 2000  
 Del.quantity cm<sup>3</sup>/: 48,0...53,0  
 1000H.: (46,5...54,5)  
 5th speed 1/min: 1500  
 Del.quantity cm<sup>3</sup>/: 53,2...58,2  
 1000H.: (51,7...59,7)  
 6th speed 1/min: 1100  
 Del.quantity cm<sup>3</sup>/: 54,0...55,0  
 1000H.: (52,0...56,0)  
 7th speed 1/min: 525  
 Del.quantity cm<sup>3</sup>/: 27,0...28,0  
 1000H.: (25,0...30,0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 350  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 350  
 Del.quantity cm<sup>3</sup>/: 10,5..14,5  
 1000H.: (8,5...16,5)  
 2nd speed 1/min: 300  
 Del.quantity cm<sup>3</sup>/: 27,0..35,0  
 1000H.: (26,0..36,0)  
 3rd speed 1/min: 400  
 Del.quantity cm<sup>3</sup>/: 0,0...5,0  
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 350  
 Del.quantity cm<sup>3</sup>/: -  
 ind. 1000H: 40,0  
  
 2nd speed 1/min: 450

Del.quantity cm<sup>3</sup>/: -  
 max. 1000H : 40,0  
  
 Shutoff electromagnet:  
 Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0  
  
 Mounting and assembly dimensions:  
 Designation  
 K mm : -  
 KF mm : K-OT  
 MS mm : 0,8...1,2  
 SVS max. mm : 3,5

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 A  
 Edition : 17.05.89  
 replaces : 10.84  
 Calibrating oil : ISO 4113  
 Injection pump : VE 4/12F1250 R123  
 Type number : 0 460 424 006

Customer-specific information  
 Customer : CDC

Engine : 4 T.390

### TEST BENCH REQUIREMENTS

Calibrating oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 016

Opening pressure bar : 207...210

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,3  
 (from BDC): +0,02(0,04)

Start of delivery block  
 Piston stroke mm: 2,00  
 mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
 Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900  
 Setting value bar: 4,5...5,1

Full-load del. w/out charge press.:

Speed 1/min : 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 85,0...86,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 18,5...24,5  
 Dispersion cm<sup>3</sup>/ : 3,5  
 1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1340  
 Del.quantity cm<sup>3</sup>/  
 1000H: 24,5...32,5

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 97,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 750
TD travel	mm: 1,1...1,9
	mm: (0,8...2,2)
2nd speed	1/min: 900
TD travel	mm: 2,3...2,7
	mm: (1,8...3,2)
3rd speed	1/min: 1100
TD travel	mm: 3,2...4,0
	mm: (2,9...4,3)
4th speed	1/min: 1250
TD travel	mm: 3,7...4,5
	mm: (3,4...4,8)

Supply-pump pressure characteristic:

1st speed	1/min: 400
Supply-pump pressure	bar: 2,3...2,9
2nd speed	1/min: 750

Supply-pump pressure bar: 3,8...4,4  
 3rd speed 1/min: 900  
 Supply-pump pressure bar: 4,5...5,1  
 4th speed 1/min: 1100  
 Supply-pump pressure bar: 5,3...5,9

Overflow quantity at overflow valve:

1st speed 1/min: 600  
 Overflow : 41...83  
 quantity cm<sup>3</sup>/10s: (26...98)  
 2nd speed 1/min: 1250  
 Overflow : 55...138  
 quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400  
 Del.quantity cm<sup>3</sup>/: 0,0...1,0  
 1000H.: -  
 2nd speed 1/min: 1340  
 Del.quantity cm<sup>3</sup>/: 24,5...32,5  
 1000H.: (23,5...33,5)  
 3rd speed 1/min: 1250  
 Del.quantity cm<sup>3</sup>/: 80,0...83,0  
 1000H.: (78,5...84,5)  
 4th speed 1/min: 1100  
 Del.quantity cm<sup>3</sup>/: 85,0...86,0  
 1000H.: (82,5...88,5)  
 5th speed 1/min: 750  
 Del.quantity cm<sup>3</sup>/: 88,5...92,5  
 1000H.: (86,7...94,3)  
 6th speed 1/min: 600  
 Del.quantity cm<sup>3</sup>/: 88,5...92,5  
 1000H.: (86,7...94,3)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 375  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: -  
 max. 1000H.: -

Idle delivery: -

1st speed 1/min: 375  
 Del.quantity cm<sup>3</sup>/: 18,5..24,5  
 1000H.: (16,5..26,5)  
 2nd speed 1/min: 450  
 Del.quantity cm<sup>3</sup>/: 0,0...1,5  
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Del.quantity cm<sup>3</sup>/: -  
 ind. 1000H: 97,0

2nd speed 1/min: 200  
 Del.quantity cm<sup>3</sup>/: -  
 max. 1000H : 85,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	1,3...1,7
SVS max.	mm	:	3,7
XK	mm	:	20,2...22,2
XL	mm	:	13,2...16,5

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 03  
 Edition : 16.05.89  
 replaces : -  
 Calibrating oil : ISO 4113  
 Injection pump : VE 4/12F1250 R239  
 Type number : 0 460 424 030

Customer-specific information  
 Customer : CDC

Engine : 4 BTA

Power k: 88  
 Speed 1/mi: 2500

### TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,3  
 (from BDC): +0,02(0,04)

Start of delivery block  
 Piston stroke mm: 1,95  
 mm: +0,02(0,06)  
 Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
 Charge press. hPa: 1000  
 Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 1100  
 Charge press. hPa: 1000  
 Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 850  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 76,0...77,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 56,0...57,0

Low-idle speed regulation:

Speed 1/min: 375  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 10,0...12,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1360  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/  
 1000H: 60,0...66,0

Start:

Speed 1/min: 100  
 Charge press. hPa: -  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 850  
 Charge press. hPa: 1000  
 TD travel mm: 0,6...1,4  
 mm: (0,3...1,7)  
 2nd speed 1/min: 1100

Charge press. hPa: 1000  
 TD travel mm: 2,0...2,4  
                   mm: (1,5...2,9)  
 3rd speed 1/min: 1250  
 Charge press. hPa: 1000  
 TD travel mm: 2,6...3,4  
                   mm: (2,3...3,7)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3,0...3,6  
 2nd speed 1/min: 850  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4,6...5,2  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 5,6...6,2  
 4th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 6,2...6,8

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: -  
 Overflow quantity cm<sup>3</sup>/10s: 41...83  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Overflow quantity cm<sup>3</sup>/10s: 55...138

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 450  
 LDA stroke mm: 6,5  
 Del.quantity cm<sup>3</sup>/: 72,0...73,0  
                   1000H.: (68,5...76,5)  
 2nd speed 1/min: 1550  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
                   1000H.: -  
 3rd speed 1/min: 1510  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 0,0...15,0  
                   1000H.: -  
 4th speed 1/min: 1470  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 15,0...55,0  
                   1000H.: -  
 5th speed 1/min: 1360  
 Charge press. hPa: 1000

Del.quantity cm<sup>3</sup>/: 60,0...66,0  
                   1000H.: 57,0...70,0  
 6th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 73,5...76,5  
                   1000H.: (72,0...78,0)  
 7th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 75,5...78,5  
                   1000H.: (73,5...80,5)  
 8th speed 1/min: 850  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 76,0...77,0  
                   1000H.: (73,5...79,5)  
 9th speed 1/min: 700  
 Charge press. hPa: 450  
 Del.quantity cm<sup>3</sup>/: 72,0...73,0  
                   1000H.: (68,5...76,5)  
 10th speed 1/min: 500  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 89,5...99,5  
                   1000H.: -  
 11th speed 1/min: 500  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/: 56,0...57,0  
                   1000H.: (52,5...60,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400  
 Del.quantity cm<sup>3</sup>/: 0..3  
                   1000H.: -

Electr. shutoff:

Speed 1/min: 400  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
                   max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
 Del.quantity cm<sup>3</sup>/: 10,0..12,0  
                   1000H.: (6,0...16,0)  
 2nd speed 1/min: 450  
 Del.quantity cm<sup>3</sup>/: 0,0...4,0  
                   1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/: -  
                   ind. 1000H: 90,0  
 2nd speed 1/min: 350  
 Charge press. hPa: -

Del. quantity cm<sup>3</sup> : -  
max. 1000H : 90,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	K-OT
MS	mm	:	1,0...1,4
SVS max.	mm	:	2,3

Remarks:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N18  
 Edition : 16.05.89  
 replaces : -  
 Calibrating oil : ISO 4113  
  
 Injection pump : VE 4/12F1250 R301  
 Type number : 0 460 424 041  
 Customer Part-No. : 3 911 241  
  
 Customer-specific information  
 Customer : CDC  
  
 Engine : 4 BTA 3,9  
  
 Power k: 88  
 Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50  
  
 Inlet press., bar : 0.35  
  
 Calibrating nozzle-holder  
 assembly : 1 688 901 027  
  
 Opening  
 pressure bar : 250...253  
  
 Perforated-plate  
 diameter mm : 0.5  
  
 Test inj. tubing : 1 680 750 017  
  
 Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840  
  
 Start of delivery  
 Prestroke mm : 0,3  
 (from BDC): +0,02(0,04)  
  
 Start of delivery block  
 Piston stroke mm: 1,25  
 mm: +0,02(0,06)  
 Outlet : A  
  
 Injection-pump setting values  
 Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 1100  
 Charge press. hPa: 1100  
 Setting value mm: 0,8...1,2  
 KSB solenoid-operated  
 valve volt: 24,0

### Supply-pump pressure:

Speed 1/min: 850  
 Charge press. hPa: 1100  
 Setting value bar: 4,5...5,1  
 KSB solenoid-operated  
 valve volt: 24,0

### Full-load del. with charge press.:

Speed 1/min: 850  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 84,5...85,5  
 KSB solenoid-operated  
 valve volt : 24,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H : (4,5)

### Full-load del. w/out charge press.:

Speed 1/min : 550  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 56,5...57,5

### Low-idle speed regulation:

Speed 1/min: 375  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 9,0...13,0  
 KSB solenoid-operated  
 valve volt: 24,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

### Full-load speed regulation:

Speed 1/min: 1340  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H: 62,0...68,0  
 KSB solenoid-operated  
 valve volt: 24,0

### Start:

Speed 1/min: 100  
 Charge press. hPa: -  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 70,0

KSB solenoid-operated  
valve volt: 24,0

## Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed	1/min:	400
Charge press.	hPa:	-
TD travel	mm:	2,5...3,5
	mm:	-
KSB solenoid-operated		
valve	volt:	-
2nd speed	1/min:	1000
Charge press.	hPa:	1100
TD travel	mm:	0,2...1,0
	mm:	(0,0...1,3)
KSB solenoid-operated		
valve	volt:	24,0
3rd speed	1/min:	1100
Charge press.	hPa:	1100
TD travel	mm:	0,8...1,2
	mm:	(0,3...1,7)
KSB solenoid-operated		
valve	volt:	24,0
4th speed	1/min:	1250
Charge press.	hPa:	1100
TD travel	mm:	1,4...2,2
	mm:	(1,1...2,5)
KSB solenoid-operated		
valve	volt:	24,0

Supply-pump pressure characteristic:

1st speed 1/min: 550  
 Charge press. hPa: 1100  
 Supply-pump  
 pressure bar: 2,9...3,5  
 KSB solenoid-operated  
 valve volt: 24,0  
 2nd speed 1/min: 850  
 Charge press. hPa: 1100  
 Supply-pump  
 pressure bar: 4,5...5,1  
 KSB solenoid-operated  
 valve volt: 24,0  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1100  
 Supply-pump  
 pressure bar: 5,5...6,1  
 KSB solenoid-operated  
 valve volt: 24,0  
 4th speed 1/min: 1250  
 Charge press. hPa: 1100  
 Supply-pump  
 pressure bar: 6,1...6,7  
 KSB solenoid-operated  
 valve volt: 24,0

Overflow quantity at overflow valve:

1st speed 1/min: 550  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 24,0  
 Overflow : 41...83  
 quantity cm<sup>3</sup>/10s: (26...98  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Overflow : 55...138  
 quantity cm<sup>3</sup>/10s: (40...15

### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting  
 point hPa: 600  
 LDA stroke mm: 6,5  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del.quantity cm<sup>3</sup>: 73,5...74,5  
 1000H.: (70,0...78,0)  
 2nd speed 1/min: 1550  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del.quantity cm<sup>3</sup>: 0,0...3,0  
 1000H.: -  
 3rd speed 1/min: 1480  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del.quantity cm<sup>3</sup>: 0,0...15,0  
 1000H.: -  
 4th speed 1/min: 1430  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del.quantity cm<sup>3</sup>: 15,0...55,0  
 1000H.: -  
 5th speed 1/min: 1340  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del.quantity cm<sup>3</sup>: 62,0...68,0  
 1000H.: (59,0...71,0)  
 6th speed 1/min: 1250  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del.quantity cm<sup>3</sup>: 79,0...82,0  
 1000H.: (77,5...83,5)  
 7th speed 1/min: 1100  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0

Del. quantity  $\text{cm}^3/\text{h}$ : 81,5...84,5  
 1000H.: (79,5...86,5)  
 8th speed 1/min: 850  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 84,5...85,5  
 1000H.: (82,0...88,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 600  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 73,5...74,5  
 1000H.: (70,0...78,0)  
 10th speed 1/min: 550  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 97,0...105,0  
 1000H.: -  
 11th speed 1/min: 550  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 56,5...57,5  
 1000H.: (53,0...61,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
 Del. quantity  $\text{cm}^3/\text{h}$ : 0..3  
 1000H.: -

Electr. shutoff:

Speed 1/min: 375  
 ELAB volt: -  
 Del. quantity  $\text{cm}^3/\text{h}$ : 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 9,0...13,0  
 1000H.: (6,0...16,0)  
 2nd speed 1/min: 450  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 0,0...4,0  
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 240  
 Charge press. hPa: -

KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : -  
 ind. 1000H: 80,0

2nd speed 1/min: 360  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : -  
 max. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 20,0  
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation	
K	mm : -
KF	mm : -
MS	mm : 0,8...1,2
SVS max.	mm : 3,2
XK	mm : 18,8...20,8
XL	mm : 12,4...15,8

Operate control lever after each  
 manifold-pressure compensator pressure  
 change.

Correction at adjusting nut (46)

Tractive electromagnet.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N16

Edition : 16.05.89

replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R301

Type number : 0 460 424 041

Customer Part-No. : 3 914 886

Customer-specific information

Customer : CDC

Engine : 4 BTA 3,9

Power k: 88  
Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. °C

with thermometer : 40...48

electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6

x Wall thickness : 2

x Length mm : 840

Start of delivery

Prestroke mm : 0,3  
(from BDC): +0,02(0,04)

Start of delivery block

Piston stroke mm: 1,25  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100

Charge press. hPa: 1100

Setting value mm: 0,8...1,2

KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 850

Charge press. hPa: 1100

Setting value bar: 4,5...5,1

KSB solenoid-operated  
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 850

Charge press. hPa: 1100

Del.quantity cm<sup>3</sup>/

1000H.: 84,5...85,5

KSB solenoid-operated  
valve volt: 12,0

Dispersion cm<sup>3</sup>/ : 4,0

1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 550

Del.quantity cm<sup>3</sup>/

1000H.: 56,5...57,5

Low-idle speed regulation:

Speed 1/min: 375

Charge press. hPa: -

Del.quantity cm<sup>3</sup>/

1000H.: 9,0...13,0

KSB solenoid-operated  
valve volt: 12,0

Dispersion cm<sup>3</sup>/ : 5,5

1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340

Charge press. hPa: 1100

Del.quantity cm<sup>3</sup>/

1000H.: 62,0...68,0

Start:

Speed 1/min: 100

Charge press. hPa: -

Del.quantity : -

mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications

Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 400  
 Charge press. hPa: -  
 TD travel mm: 2,5...3,5  
 mm: -  
 KSB solenoid-operated valve volt: -  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1100  
 TD travel mm: 0,2...1,0  
 mm: (0,0...1,3)  
 KSB solenoid-operated valve volt: 12,0  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1100  
 TD travel mm: 0,8...1,2  
 mm: (0,3...1,7)  
 KSB solenoid-operated valve volt: 12,0  
 4th speed 1/min: 1250  
 Charge press. hPa: 1100  
 TD travel mm: 1,4...2,2  
 mm: (1,1...2,5)  
 KSB solenoid-operated valve volt: 12,0

### Supply-pump pressure characteristic:

1st speed 1/min: 550  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 2,9...3,5  
 KSB solenoid-operated valve volt: 12,0  
 2nd speed 1/min: 850  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 4,5...5,1  
 KSB solenoid-operated valve volt: 12,0  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 5,5...6,1  
 KSB solenoid-operated valve volt: 12,0  
 4th speed 1/min: 1250  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 6,1...6,7  
 KSB solenoid-operated valve volt: 12,0

### Overflow quantity at overflow valve:

1st speed 1/min: 550  
 Charge press. hPa: -

KSB solenoid-operated valve volt: 12,0  
 Overflow : 41...83  
 quantity cm<sup>3</sup>/10s: (26...98)  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Overflow : 55...138  
 quantity cm<sup>3</sup>/10s: (40...153)  
 Delivery-quant. and breakaway char.:  
 1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 600  
 LDA stroke mm: 6,5  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 73,5...74,5  
 1000H.: (70,0...78,0)  
 2nd speed 1/min: 1550  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 1000H.: -  
 3rd speed 1/min: 1480  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 0,0...15,0  
 1000H.: -  
 4th speed 1/min: 1430  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 15,0...55,0  
 1000H.: -  
 5th speed 1/min: 1340  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 62,0...68,0  
 1000H.: (59,0...71,0)  
 6th speed 1/min: 1250  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 79,0...82,0  
 1000H.: (77,5...83,5)  
 7th speed 1/min: 1100  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 81,5...84,5  
 1000H.: (79,5...86,5)  
 8th speed 1/min: 850  
 Charge press. hPa: 1100

KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 84,5...85,5  
 1000H: (82,0...88,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 600  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 73,5...74,5  
 1000H: (70,0...78,0)  
 10th speed 1/min: 550  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 97,0...105,0  
 1000H: -  
 11th speed 1/min: 550  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 56,5...57,5  
 1000H: (53,0...61,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
 Del. quantity cm<sup>3</sup>/: 0,3  
 1000H.: -

Electr. shutoff:

Speed 1/min: 375  
 ELAB volt: -  
 Del. quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 9,0...13,0  
 1000H.: (6,0...16,0)  
 2nd speed 1/min: 450  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 0,0...4,0  
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 240  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: -  
 ind. 1000H: 80,0

2nd speed 1/min: 360  
 Charge press. hPa: -

Del. quantity cm<sup>3</sup>/: -  
 max. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	-
MS	mm	:	0,8...1,2
SVS max.	mm	:	3,2
XK	mm	:	18,8...20,8
XL	mm	:	12,4...15,8

Remarks:

Operate control lever after each  
 manifold-pressure compensator pressure  
 change.

Correction at adjusting nut (46)

Tractive electromagnet.

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N17  
 Edition : 16.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R301  
 Type number : 0 460 424 041  
 Customer Part-No. : 3 914 887

Customer-specific information  
 Customer : CDC

Engine : 4 BTA 3,9

Power k: 88  
 Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,3  
 (from BDC): +0,02(0,04)

Start of delivery block  
 Piston stroke mm: 1,25  
 mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 1100  
 Charge press. hPa: 1100  
 Setting value mm: 0,8...1,2  
 KSB solenoid-operated  
 valve volt: 24,0

## Supply-pump pressure:

Speed 1/min: 850  
 Charge press. hPa: 1100  
 Setting value bar: 4,5...5,1  
 KSB solenoid-operated  
 valve volt: 24,0

## Full-load del. with charge press.:

Speed 1/min: 850  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 84,5...85,5  
 KSB solenoid-operated  
 valve volt: 24,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H.: (4,5)

## Full-load del. w/out charge press.:

Speed 1/min : 550  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 56,5...57,5

## Low-idle speed regulation:

Speed 1/min: 375  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 9,0...13,0  
 KSB solenoid-operated  
 valve volt: 24,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

## Full-load speed regulation:

Speed 1/min: 1340  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 62,0...68,0  
 KSB solenoid-operated  
 valve volt: 24,0

## Start:

Speed 1/min: 100  
 Charge press. hPa: -  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 70,0

KSB solenoid-operated  
valve volt: 24,0

## Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed	1/min:	400
Charge press.	hPa:	-
TD travel	mm:	2,5...3,5
	mm:	-
KSB solenoid-operated		
valve	volt:	-
2nd speed	1/min:	1000
Charge press.	hPa:	1100
TD travel	mm:	0,2...1,0
	mm:	(0,0...1,3)
KSB solenoid-operated		
valve	volt:	24,0
3rd speed	1/min:	1100
Charge press.	hPa:	1100
TD travel	mm:	0,8...1,2
	mm:	(0,3...1,7)
KSB solenoid-operated		
valve	volt:	24,0
4th speed	1/min:	1250
Charge press.	hPa:	1100
TD travel	mm:	1,4...2,2
	mm:	(1,1...2,5)
KSB solenoid-operated		
valve	volt:	24,0

### Supply-air pressure characteristic:

1st speed 1/min: 550  
 Charge press. hPa: 1100  
**Supply-pump**  
 pressure bar: 2,9...3,5  
**KSB solenoid-operated**  
 valve volt: 24,0  
 2nd speed 1/min: 850  
 Charge press. hPa: 1100  
**Supply-pump**  
 pressure bar: 4,5...5,1  
**KSB solenoid-operated**  
 valve volt: 24,0  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1100  
**Supply-pump**  
 pressure bar: 5,5...6,1  
**KSB solenoid-operated**  
 valve volt: 24,0  
 4th speed 1/min: 1250  
 Charge press. hPa: 1100  
**Supply-pump**  
 pressure bar: 6,1...6,7  
**KSB solenoid-operated**  
 valve volt: 24,0

Overflow quantity at overflow valve:

1st speed 1/min: 550  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 24,0  
 Overflow : 41...83  
 quantity cm<sup>3</sup>/10s: (26...98)  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Overflow : 55...138  
 quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting  
 point hPa: 600  
 LDA stroke mm: 6,5  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del.quantity cm<sup>3</sup>: 73,5...74,5  
 1000H.: (70,0...78,0)  
 2nd speed 1/min: 1550  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del.quantity cm<sup>3</sup>: 0,0...3,0

3rd speed 1/min: 1480  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del.quantity cm<sup>3</sup>: 0,0...15,0  
 1000H.: -  
 4th speed 1/min: 1430  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del.quantity cm<sup>3</sup>: 15,0...55,0  
 1000H.: -

5th speed 1/min: 1340  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del.quantity cm<sup>3</sup>: 62,0...68,0  
 1000H.: (59,0...71,0)  
 6th speed 1/min: 1250  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del.quantity cm<sup>3</sup>: 79,0...82,0  
 1000H.: (77,5...83,5)  
 7th speed 1/min: 1100  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0

Del. quantity  $\text{cm}^3/\text{h}$ : 81,5...84,5  
 1000H.: (79,5...86,5)  
 8th speed 1/min: 850  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 84,5...85,5  
 1000H.: (82,0...88,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 600  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 73,5...74,5  
 1000H.: (70,0...78,0)  
 10th speed 1/min: 550  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 97,0...105,0  
 1000H.: -  
 11th speed 1/min: 550  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 56,5...57,5  
 1000H.: (53,0...61,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
 Del. quantity  $\text{cm}^3/\text{h}$ : 0..3  
 1000H.: -

Electr. shutoff:

Speed 1/min: 375  
 ELAB volt: -  
 Del. quantity  $\text{cm}^3/\text{h}$ : 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 9,0...13,0  
 1000H.: (6,0...16,0)  
 2nd speed 1/min: 450  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 0,0...4,0  
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 240  
 Charge press. hPa: -

KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : -  
 ind. 1000H: 80,0

2nd speed 1/min: 360  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 24,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : -  
 max. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 20,0  
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation	
K	mm : -
KF	mm : -
MS	mm : 0,8...1,2
SVS max.	mm : 3,2
XK	mm : 18,8...20,8
XL	mm : 12,4...15,8

Operate control lever after each  
 manifold-pressure compensator pressure  
 change.

Correction at adjusting nut (46)

Tractive electromagnet.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N14  
 Edition : 16.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R301  
 Type number : 0 460 424 041  
 Customer Part-No. : 3 915 287

Customer-specific information  
 Customer : CDC

Engine : 4 BTA 3,9  
 Power k: 88  
 Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,3  
 (from BDC): +0,02(0,04)

Start of delivery block  
 Piston stroke mm: 1,25  
 mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 1100  
 Charge press. hPa: 1100  
 Setting value mm: 0,8...1,2  
 KSB solenoid-operated  
 valve volt: 12,0

## Supply-pump pressure:

Speed 1/min: 850  
 Charge press. hPa: 1100  
 Setting value bar: 4,5...5,1  
 KSB solenoid-operated  
 valve volt: 12,0

## Full-load del. with charge press.:

Speed 1/min: 850  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 84,5...85,5  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/  
 1000H.: (4,5)

## Full-load del. w/out charge press.:

Speed 1/min : 550  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 56,5...57,5

## Low-idle speed regulation:

Speed 1/min: 375  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 9,0...13,0  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/  
 1000H.: (7,0)

## Full-load speed regulation:

Speed 1/min: 1340  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H: 62,0...68,0

## Start:

Speed 1/min: 100  
 Charge press. hPa: -  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
 Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 400  
 Charge press. hPa: -  
 TD travel mm: 2,5...3,5  
 mm: -  
 KSB solenoid-operated valve volt: -  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1100  
 TD travel mm: 0,2...1,0  
 mm: (0,0...1,3)  
 KSB solenoid-operated valve volt: 12,0  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1100  
 TD travel mm: 0,8...1,2  
 mm: (0,3...1,7)  
 KSB solenoid-operated valve volt: 12,0  
 4th speed 1/min: 1250  
 Charge press. hPa: 1100  
 TD travel mm: 1,4...2,2  
 mm: (1,1...2,5)  
 KSB solenoid-operated valve volt: 12,0

### Supply-pump pressure characteristic:

1st speed 1/min: 550  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 2,9...3,5  
 KSB solenoid-operated valve volt: 12,0  
 2nd speed 1/min: 850  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 4,5...5,1  
 KSB solenoid-operated valve volt: 12,0  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 5,5...6,1  
 KSB solenoid-operated valve volt: 12,0  
 4th speed 1/min: 1250  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 6,1...6,7  
 KSB solenoid-operated valve volt: 12,0

### Overflow quantity at overflow valve:

1st speed 1/min: 550  
 Charge press. hPa: -

KSB solenoid-operated valve volt: 12,0  
 Overflow : 41...83  
 quantity cm<sup>3</sup>/10s: (26...98)  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Overflow : 55...138  
 quantity cm<sup>3</sup>/10s: (40...153)  
 Delivery-quant. and breakaway char.:  
 1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 600  
 LDA stroke mm: 6,5  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 73,5...74,5  
 1000H.: (70,0...78,0)  
 2nd speed 1/min: 1550  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 1000H.: -  
 3rd speed 1/min: 1480  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 0,0...15,0  
 1000H.: -  
 4th speed 1/min: 1430  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 15,0...55,0  
 1000H.: -  
 5th speed 1/min: 1340  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 62,0...68,0  
 1000H.: (59,0...71,0)  
 6th speed 1/min: 1250  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 79,0...82,0  
 1000H.: (77,5...83,5)  
 7th speed 1/min: 1100  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 81,5...84,5  
 1000H.: (79,5...86,5)  
 8th speed 1/min: 850  
 Charge press. hPa: 1100

KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 84,5...85,5  
 1000H: (82,0...88,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 600  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 73,5...74,5  
 1000H: (70,0...78,0)  
 10th speed 1/min: 550  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 97,0...105,0  
 1000H: -  
 11th speed 1/min: 550  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 56,5...57,5  
 1000H: (53,0...61,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
 Del. quantity cm<sup>3</sup>/: 0..3  
 1000H.: -

Electr. shutoff:

Speed 1/min: 375  
 ELAB volt: -  
 Del. quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 9,0...13,0  
 1000H.: (6,0...16,0)  
 2nd speed 1/min: 450  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 0,0...4,0  
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 240  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: -  
 ind. 1000H: 80,0  
 2nd speed 1/min: 360  
 Charge press. hPa: -

Del. quantity cm<sup>3</sup>/: -  
 max. 1000H: 80,0  
 Shutoff electromagnet:  
 Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0  
 Mounting and assembly dimensions:  
 Designation  
 K mm : -  
 KF mm : -  
 MS mm : 0,8...1,2  
 SVS max. mm : 3,2  
 XK mm : 18,8...20,8  
 XL mm : 12,4...15,8

Remarks:  
 Operate control lever after each  
 manifold-pressure compensator pressure  
 change.

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N15  
 Edition : 16.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R301  
 Type number : 0 460 424 041  
 Customer Part-No. : 3 915 427

Customer-specific information  
 Customer : CDC

Engine : 4 BTA 3,9

Power k: 88  
 Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,3  
 (from BDC): +0,02(0,04)

Start of delivery block  
 Piston stroke mm: 1,25  
 mm: +0,02(0,06)  
 Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 1100  
 Charge press. hPa: 1100  
 Setting value mm: 0,8...1,2  
 KSB solenoid-operated  
 valve volt: 12,0

## Supply-pump pressure:

Speed 1/min: 850  
 Charge press. hPa: 1100  
 Setting value bar: 4,5...5,1  
 KSB solenoid-operated  
 valve volt: 12,0

## Full-load del. with charge press.:

Speed 1/min: 850  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 84,5...85,5  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H.: (4,5)

## Full-load del. w/out charge press.:

Speed 1/min : 550  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 56,5...57,5

## Low-idle speed regulation:

Speed 1/min: 375  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 9,0...13,0  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

## Full-load speed regulation:

Speed 1/min: 1340  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 62,0...68,0

## Start:

Speed 1/min: 100  
 Charge press. hPa: -  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
 Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 400  
 Charge press. hPa: -  
 TD travel mm: 2,5...3,5  
 mm: -  
 KSB solenoid-operated valve volt: -  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1100  
 TD travel mm: 0,2...1,0  
 mm: (0,0...1,3)  
 KSB solenoid-operated valve volt: 12,0  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1100  
 TD travel mm: 0,8...1,2  
 mm: (0,3...1,7)  
 KSB solenoid-operated valve volt: 12,0  
 4th speed 1/min: 1250  
 Charge press. hPa: 1100  
 TD travel mm: 1,4...2,2  
 mm: (1,1...2,5)  
 KSB solenoid-operated valve volt: 12,0

### Supply-pump pressure characteristic:

1st speed 1/min: 550  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 2,9...3,5  
 KSB solenoid-operated valve volt: 12,0  
 2nd speed 1/min: 850  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 4,5...5,1  
 KSB solenoid-operated valve volt: 12,0  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 5,5...6,1  
 KSB solenoid-operated valve volt: 12,0  
 4th speed 1/min: 1250  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 6,1...6,7  
 KSB solenoid-operated valve volt: 12,0

### Overflow quantity at overflow valve:

1st speed 1/min: 550  
 Charge press. hPa: -

KSB solenoid-operated valve volt: 12,0  
 Overflow quantity cm<sup>3</sup>/10s: 41...83 (26...98)  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Overflow quantity cm<sup>3</sup>/10s: 55...138 (40...153)  
 Delivery-quant. and breakaway char.:  
 1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 600  
 LDA stroke mm: 6,5  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>: 73,5...74,5 1000H.: (70,0...78,0)  
 2nd speed 1/min: 1550  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>: 0,0...3,0 1000H.: -  
 3rd speed 1/min: 1480  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>: 0,0...15,0 1000H.: -  
 4th speed 1/min: 1430  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>: 15,0...55,0 1000H.: -  
 5th speed 1/min: 1340  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>: 62,0...68,0 1000H.: (59,0...71,0)  
 6th speed 1/min: 1250  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>: 79,0...82,0 1000H.: (77,5...83,5)  
 7th speed 1/min: 1100  
 Charge press. hPa: 1100  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>: 81,5...84,5 1000H.: (79,5...86,5)  
 8th speed 1/min: 850  
 Charge press. hPa: 1100

KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 84,5...85,5  
                   1000H: (82,0...88,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 600  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 73,5...74,5  
                   1000H: (70,0...78,0)  
 10th speed 1/min: 550  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 97,0...105,0  
                   1000H: -  
 11th speed 1/min: 550  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 56,5...57,5  
                   1000H: (53,0...61,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
 Del. quantity cm<sup>3</sup>/: 0,3  
                   1000H: -

Electr. shutoff:

Speed 1/min: 375  
 ELAB volt: -  
 Del. quantity cm<sup>3</sup>/: 0,0...3,0  
                   max. 1000H: -

Idle delivery:

1st speed 1/min: 375  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 9,0...13,0  
                   1000H: (6,0...16,0)  
 2nd speed 1/min: 450  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 0,0...4,0  
                   1000H: -

Automatic starting fuel delivery:

1st speed 1/min: 240  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/:  
   ind. 1000H: 80,0

2nd speed 1/min: 360  
 Charge press. hPa: -

Del. quantity cm<sup>3</sup>/: -  
 max. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	-
MS	mm	:	0,8...1,2
SVS max.	mm	:	3,2
XK	mm	:	18,8...20,8
XL	mm	:	12,4...15,8

Remarks:

Operate control lever after each  
 manifold-pressure compensator pressure  
 change.

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9N11  
 Edition : 17.05.89  
 replaces : -  
 Calibrating oil : ISO 4113  
 Injection pump : VE 4/12F1250 R301  
 Type number : 0 460 424 041  
 Customer Part-No. :

Customer-specific information  
 Customer : CDC

Engine : 4 BTA 390 A

Power k: 88  
 Speed 1/mi: 2500

### TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,3  
 (from BDC): +0,02(0,04)

Start of delivery block  
 Piston stroke mm: 1,25  
 mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
 Charge press. hPa: 1100  
 Setting value mm: 0,8...1,2  
 KSB solenoid-operated  
 valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 850  
 Charge press. hPa: 1100  
 Setting value bar: 4,5...5,1  
 KSB solenoid-operated  
 valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 850  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 84,5...85,5  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 550  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 56,5...57,5  
 KSB solenoid-operated  
 valve volt: 12,0

Low-idle speed regulation:

Speed 1/min: 375  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 9,0...13,0  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H: 62,0...68,0  
 KSB solenoid-operated  
 valve volt: 12,0

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 70,0

KSB solenoid-operated  
valve volt: 12,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400  
Charge press. hPa: -  
TD travel mm: 2,5...3,5  
mm: -  
KSB solenoid-operated  
valve volt: -  
2nd speed 1/min: 1000  
Charge press. hPa: 1100  
TD travel mm: 0,2...1,0  
mm: (0,0...1,3)  
KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1100  
Charge press. hPa: 1100  
TD travel mm: 0,8...1,2  
mm: (0,3...1,7)  
KSB solenoid-operated  
valve volt: 12,0  
4th speed 1/min: 1250  
Charge press. hPa: 1100  
TD travel mm: 1,4...2,2  
mm: (1,1...2,5)  
KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 550  
Charge press. hPa: 1100  
Supply-pump  
pressure bar: 2,9...3,5  
KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 850  
Charge press. hPa: 1100  
Supply-pump  
pressure bar: 4,5...5,1  
KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1100  
Charge press. hPa: 1100  
Supply-pump  
pressure bar: 5,5...6,1  
KSB solenoid-operated  
valve volt: 12,0  
4th speed 1/min: 1250  
Charge press. hPa: 1100  
Supply-pump  
pressure bar: 6,1...6,7  
KSB solenoid-operated  
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 550  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1100  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 600  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 73,5...74,5  
1000H.: (70,0...78,0)  
2nd speed 1/min: 1550  
Charge press. hPa: 1100  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: (0,0...3,0)  
3rd speed 1/min: 1480  
Charge press. hPa: 1100  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: (0,0...15,0)  
4th speed 1/min: 1430  
Charge press. hPa: 1100  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: (15,0...55,0)  
5th speed 1/min: 1340  
Charge press. hPa: 1100  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 62,0...68,0  
1000H.: (59,0...71,0)  
6th speed 1/min: 1250  
Charge press. hPa: 1100  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 79,0...82,0  
1000H.: (77,5...83,5)  
7th speed 1/min: 1100  
Charge press. hPa: 1100  
KSB solenoid-operated  
valve volt: 12,0

Del. quantity  $\text{cm}^3/\text{h}$ : 81,5...84,5  
 1000H.: (79,5...86,5)  
 8th speed 1/min: 850  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 84,5...85,5  
 1000H.: (82,0...88,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 600  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 73,5...74,5  
 1000H.: (70,0...78,0)  
 10th speed 1/min: 550  
 Charge press. hPa: 1100  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 97,0...105,0  
 1000H.: -  
 11th speed 1/min: 550  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 56,5...57,5  
 1000H.: (53,0...61,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
 Del. quantity  $\text{cm}^3/\text{h}$ : 0..3  
 1000H.: -

Electr. shutoff:

Speed 1/min: 375  
 E LAB volt: -  
 Del. quantity  $\text{cm}^3/\text{h}$ : 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 9,0...13,0  
 1000H.: (6,0...16,0)  
 2nd speed 1/min: 450  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : 0,0...4,0  
 1000H.: (0,0...4,0)

Automatic starting fuel delivery:

1st speed 1/min: 240  
 KSB solenoid-operated  
 valve volt: 12,0

Del. quantity  $\text{cm}^3/\text{h}$ : -  
 ind. 1000H: 80,0

2nd speed 1/min: 360  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity  $\text{cm}^3/\text{h}$ : -  
 max. 1000H : 80,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation	
K	mm : -
MS	mm : 0,8...1,2
SVS max.	mm : 3,2
XK	mm : 18,8...20,8
XL	mm : 12,4...15,8

Remarks:

:  
Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : HEP 3,7 A  
 Edition : 08.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 4/12F1400 R314  
 Type number : 0 460 424 044

Customer-specific information  
 Customer : HERCULES

Engine : DT 3,7 L

Power k: 77  
 Speed 1/mi: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,3  
 (from BDC) : +0,02(0,04)

Indicator setting:  
 Piston stroke mm: 1.0  
 Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
 Charge press. hPa: 1000  
 Setting value mm: 1,6...2,0

Supply-pump pressure:

Speed 1/min: 900  
 Charge press. hPa: 1000  
 Setting value bar: 4,1...4,7

Full-load del. with charge press.:

Speed 1/min: 900  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 73,5...74,5  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H : 4,5

Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 37,0...38,0

Low-idle speed regulation:

Speed 1/min: 250  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 2,0...4,0

Full-load speed regulation:

Speed 1/min: 1480  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/  
 1000H: 52,0...58,0

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 50,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
 Charge press. hPa: 1000  
 TD travel mm: 0,6...1,4  
 mm: (0,3...1,7)  
 2nd speed 1/min: 900  
 Charge press. hPa: 1000  
 TD travel mm: 1,6...2,0  
 mm: (1,1...2,5)  
 3rd speed 1/min: 1250

Charge press. hPa: 1000  
TD travel mm: 2,7...3,5  
mm: (2,4...3,8)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2,5...3,1  
2nd speed 1/min: 900  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4,1...4,7  
3rd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5,5...6,1

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 400  
LDA stroke mm: 6,2  
Del.quantity cm<sup>3</sup>/: 66,5...67,5  
1000H.: (63,0...71,0)  
2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
3rd speed 1/min: 1580  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1540  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -  
5th speed 1/min: 1480  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 52,0...58,0  
1000H.: (49,0...61,0)  
6th speed 1/min: 1400  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 66,0...69,0  
1000H.: (64,5...70,5)  
7th speed 1/min: 1100  
Charge press. hPa: 1000

Del.quantity cm<sup>3</sup>/: 69,5...72,5  
1000H.: (67,5...74,5)  
8th speed 1/min: 900  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 73,5...74,5  
1000H.: (71,0...77,0)  
9th speed 1/min: 700  
Charge press. hPa: 400  
Del.quantity cm<sup>3</sup>/: 66,5...67,5  
1000H.: (63,0...71,0)  
10th speed 1/min: 500  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 79,0...87,0  
1000H.: -  
11th speed 1/min: 500  
Charge press. hPa: -  
Del.quantity cm<sup>3</sup>/: 37,0...38,0  
1000H.: (33,5...41,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 250  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 250  
Del.quantity cm<sup>3</sup>/: 2,0...4,0  
1000H.: (0,0...6,0)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 50,0

2nd speed 1/min: 250  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H: 30,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation K mm : -

KF	mm : 5,0...5,4
MS	mm : 1,0...1,4
SVS max.	mm : 2,7
XK	mm : 18,8...20,8
XL	mm : 11,8...15,2

Remarks:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N12  
 Edition : 12.05.89  
 replaces : -  
 Calibrating oil : ISO 4113  
 Injection pump : VE 4/12F1250 R226-9  
 Type number : 0 460 424 048

Customer-specific information  
 Customer : CDC

Engine : 4 BT

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,3  
 (from BDC) : +0,02(0,04)

Start of delivery block  
 Piston stroke mm: 1,80  
 mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
 Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 900  
 Setting value bar: 4,6...5,2

Full-load del. w/out charge press.:

Speed 1/min : 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 60,5...61,5  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 335  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 9,0...11,0

Full-load speed regulation:

Speed 1/min: 1310  
 Del.quantity cm<sup>3</sup>/  
 1000H: 42,0...48,0

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 45,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
 TD travel mm: 0,9...1,7  
 mm: (0,6...2,0)  
 2nd speed 1/min: 900  
 TD travel mm: 2,0...2,4  
 mm: (1,5...2,9)  
 3rd speed 1/min: 1100  
 TD travel mm: 2,9...3,7  
 mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Supply-pump pressure bar: 2,7...3,3  
 2nd speed 1/min: 750  
 Supply-pump pressure bar: 3,9...4,5  
 3rd speed 1/min: 900  
 Supply-pump pressure bar: 4,6...5,2  
 4th speed 1/min: 1100

Supply-pump  
pressure bar: 5,4...6,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1430  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1380  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1340  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -  
4th speed 1/min: 1310  
Del.quantity cm<sup>3</sup>/: 42,0...48,0  
1000H.: (39,0...51,0)  
5th speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 59,0...62,0  
1000H.: (57,5...63,5)  
6th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 60,5...61,5  
1000H.: (58,0...64,0)  
7th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 60,5...64,5  
1000H.: (58,5...66,5)  
8th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 56,0...66,0  
1000H.: (55,0...67,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 335  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 335  
Del.quantity cm<sup>3</sup>/: 9,0...11,0  
1000H.: (5,0...15,0)  
2nd speed 1/min: 500

Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 45,0  
2nd speed 1/min: 300  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	0,8...1,2
SVS max.	mm	:	4,7
XK	mm	:	18,8...20,8
XL	mm	:	11,8...14,9

Remarks:

# BOSCH-INK.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : HEP 3,7 B

Edition : 09.05.89

replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 4/12F1400 R314-1  
Type number : 0 460 424 049

Customer-specific information

Customer : HERCULES

Engine : DT - 3,7 L

Power k: 91

Speed 1/mi: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. °C

with thermometer : 40...48

electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6

x Wall thickness : 2

x Length mm : 840

Start of delivery

Prestroke mm : 0,3  
(from BDC): +0,02(0,04)

Injection-pump setting values

Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

Charge press. hPa: 1000

Setting value mm: 1,7...2,1

Supply-pump pressure:

Speed 1/min: 900

Charge press. hPa: 1000

Setting value bar: 3,7...4,3

Full-load del. with charge press.:

Speed 1/min: 900

Charge press. hPa: 1000

Del.quantity cm<sup>3</sup>/

1000H.: 79,0...80,0

Dispersion cm<sup>3</sup>/ : 4,0

1000H : 4,5

Full-load del. w/out charge press.:

Speed 1/min : 500

Del.quantity cm<sup>3</sup>/

1000H.: 38,5...39,5

Low-idle speed regulation:

Speed 1/min: 250

Charge press. hPa: -

Del.quantity cm<sup>3</sup>/

1000H.: 7,5...9,5

Full-load speed regulation:

Speed 1/min: 1480

Charge press. hPa: 1000

Del.quantity cm<sup>3</sup>/

1000H: 53,0...59,0

Start:

Speed 1/min: 100

Charge press. hPa: -

Del.quantity : -

mind cm<sup>3</sup>/1000H.: 50,0

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750

Charge press. hPa: 1000

TD travel mm: 0,8...1,6

mm: (0,5...1,9)

2nd speed 1/min: 900

Charge press. hPa: 1000

TD travel mm: 1,7...2,1

mm: (1,2...2,6)

3rd speed 1/min: 1250

Charge press. hPa: 1000

TD travel mm: 2,9...3,7

mm: (2,6...4,0)

### Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 2,1...2,7  
 2nd speed 1/min: 900  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3,7...4,3  
 3rd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 5,1...5,7

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: -  
 Overflow quantity cm<sup>3</sup>/10s: 41,83 (26...98)  
 2nd speed 1/min: 1400  
 Charge press. hPa: 1000  
 Overflow quantity cm<sup>3</sup>/10s: 55...138 (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 550  
 LDA stroke mm: 7,1  
 Del.quantity cm<sup>3</sup>/: 70,5...71,5  
 1000H.: (67,0...75,0)  
 2nd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 1000H.: -  
 3rd speed 1/min: 1580  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 0,0...15,0  
 1000H.: -  
 4th speed 1/min: 1540  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 15,0...55,0  
 1000H.: -  
 5th speed 1/min: 1480  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 53,0...59,0  
 1000H.: (50,0...62,0)  
 6th speed 1/min: 1400  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 69,0...72,0  
 1000H.: (67,5...73,5)  
 7th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 74,0...77,0  
 1000H.: (72,0...79,0)  
 8th speed 1/min: 900

Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 79,0...80,0  
 1000H.: (76,5...82,5)  
 9th speed 1/min: 700  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 70,5...71,5  
 1000H.: (67,0...75,0)  
 10th speed 1/min: 500  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 86,0...94,0  
 1000H.: -  
 11th speed 1/min: 500  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 38,5...39,5  
 1000H.: (35,0...43,0)

### Zero delivery (stop):

#### Mech. shutoff:

Speed 1/min: 1400  
 Del.quantity cm<sup>3</sup>/: 0..3  
 1000H.: -

#### Electr. shutoff:

Speed 1/min: 250  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

#### Idle delivery:

1st speed 1/min: 250  
 Del.quantity cm<sup>3</sup>/: 7,5...9,5  
 1000H.: (3,5...13,5)

#### Automatic starting fuel delivery:

1st speed 1/min: 130  
 Del.quantity cm<sup>3</sup>/: -  
 ind. 1000H: 50,0

2nd speed 1/min: 250  
 Del.quantity cm<sup>3</sup>/: -  
 max. 1000H: 30,0

#### Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

#### Mounting and assembly dimensions:

Designation mm : -  
 K mm : 5,0...5,4  
 KF mm : 1,0...1,4  
 MS mm : 1,5  
 SVS max. mm : 1,5

XK            mm : 18,8...20,8  
XL            mm : 12,6...16,0

Remarks:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 0  
 Compl. date: 846  
 Edition : 16.05.89  
 replaces : -  
 Calibrating oil : ISO 4113  
 Injection pump : VE 4/12F1400 R239-2  
 Type number : 0 460 424 051  
 Customer Part-No. : 3 906 323

Customer-specific information  
 Customer : CDC

Engine : 4 BTA 3.9 AU

Power k: 90  
 Speed 1/mi: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,3  
 (from BDC): +0,02(0,04)

Start of delivery block  
 Piston stroke mm: 1,95  
 mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
 Charge press. hPa: 1000  
 Setting value mm: 1,8...2,2

Supply-pump pressure:

Speed 1/min: 1100  
 Charge press. hPa: 1000  
 Setting value bar: 5,7...6,3

Full-load del. with charge press.:

Speed 1/min: 750  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 86,0...87,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 58,5...59,5

Low-idle speed regulation:

Speed 1/min: 400  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 4,0...6,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1480  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 61,5...67,5

Start:

Speed 1/min: 100  
 Del.quantity : 70,0...140,0  
 mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

Mfg. date: until : 846

1st speed 1/min: 850  
 Charge press. hPa: 1000  
 TD travel mm: 0,8...1,6  
 mm: (0,5...1,9)

2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 TD travel mm: 1,8...2,2  
               mm: (1,3...2,7)  
 3rd speed 1/min: 1250  
 Charge press. hPa: 1000  
 TD travel mm: 2,2...3,0  
               mm: (1,9...3,3)  
  
 Mfg. date: from : 945  
  
 1st speed 1/min: 850  
 Charge press. hPa: 1000  
 TD travel mm: 0,8...1,6  
               mm: (0,5...1,9)  
 2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 TD travel mm: 1,8...2,2  
               mm: (1,3...2,7)  
 3rd speed 1/min: 1250  
 Charge press. hPa: 1000  
 TD travel mm: 2,2...3,0  
               mm: (1,9...3,3)

Supply-pump pressure characteristic:

Mfg. date: until : 846  
 1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3,2...3,8  
 2nd speed 1/min: 850  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4,7...5,3  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 5,7...6,3  
 4th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 6,3...6,9

Mfg date: from : 945  
 1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3,2...3,8  
 2nd speed 1/min: 850  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4,7...5,3  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 5,7...6,3  
 4th speed 1/min: 1250  
 Charge press. hPa: 1000

Supply-pump pressure bar: 6,3...6,9  
  
 Overflow quantity at overflow valve:  
  
 1st speed 1/min: 500  
 Overflow : 41...83  
               quantity cm<sup>3</sup>/10s: (26...98)  
 2nd speed 1/min: 1400  
 Charge press. hPa: 1000  
 Overflow : 55...138  
               quantity cm<sup>3</sup>/10s: (40...153)  
  
 Delivery-quant. and breakaway char.:  
  
 Mfg. date: until : 846  
 1st speed 1/min: 1640  
 Charge-air pressure-setting point hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
               1000H.: (0,0...3,0)  
 2nd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 0,0...15,0  
               1000H.: (0,0...15,0)  
 3rd speed 1/min: 1560  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 15,0...55,0  
               1000H.: (15,0...55,0)  
 4th speed 1/min: 1480  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 61,5...67,5  
               1000H.: (58,5...70,5)  
 5th speed 1/min: 1400  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 73,0...76,0  
               1000H.: (71,5...77,5)  
 6th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 79,0...82,0  
               1000H.: (77,0...84,0)  
 7th speed 1/min: 750  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 86,0...87,0  
               1000H.: (83,5...89,5)  
 8th speed 1/min: 700  
 Charge press. hPa: 330  
 Del.quantity cm<sup>3</sup>/: 72,0...73,0  
               1000H.: (68,5...76,5)  
 9th speed 1/min: 500  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 98,0...108,0  
               1000H: -  
 10th speed 1/min: 500  
 Del.quantity cm<sup>3</sup>/: 58,5...59,5  
               1000H.: (55,0...63,0)  
  
 Mfg. date: from : 945  
 1st speed 1/min: 700

Charge-air pressure setting point hPa: 330  
 LDA stroke mm: 7,2  
 Del.quantity cm<sup>3</sup>/: 64,5...65,5  
 1000H.: (61,0...69,0)  
 2nd speed 1/min: 1640  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 1000H.: -  
 3rd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 0,0...15,0  
 1000H.: -  
 4th speed 1/min: 1560  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 15,0...55,0  
 1000H.: -  
 5th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 48,5...54,5  
 1000H.: (45,5...57,5)  
 6th speed 1/min: 1400  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 71,0...74,0  
 1000H.: (69,5...75,5)  
 7th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 77,0...80,0  
 1000H.: (75,0...82,0)  
 8th speed 1/min: 750  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 82,0...83,0  
 1000H.: (79,5...85,5)  
 9th speed 1/min: 700  
 Charge press. hPa: 330  
 Del.quantity cm<sup>3</sup>/: 64,5...65,5  
 1000H.: (61,0...69,0)  
 10th speed 1/min: 500  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/: 94,0...104,0  
 1000H.: -  
 11th speed 1/min: 500  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/: 55,5...56,5  
 1000H.: (52,0...60,0)

#### Zero delivery (stop):

#### Mech. shutoff:

Speed 1/min: 1400  
 Del.quantity cm<sup>3</sup>/: 0..3  
 1000H.: -

#### Electr. shutoff:

Speed 1/min: 400  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

#### Idle delivery:

1st speed 1/min: 400  
 Del.quantity cm<sup>3</sup>/: 4,0...6,0  
 1000H.: (0,0...10,0)  
 2nd speed 1/min: 450  
 Del.quantity cm<sup>3</sup>/: 0,0...4,0  
 1000H.: -

#### Automatic starting fuel delivery:

1st speed 1/min: 230  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/: -  
 ind. 1000H: 80,0  
 2nd speed 1/min: 400  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/: -  
 max. 1000H: 80,0

#### Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

#### Mounting and assembly dimensions:

##### Designation

K	mm	:	-
KF	mm	:	K-OT
MS	mm	:	1,0...1,4
SVS max.	mm	:	2,5
XK	mm	:	21,8...23,8
XL	mm	:	11,5...14,9

#### Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U27  
 Edition : 16.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R195  
 Type number : 0 460 426 059

Customer-specific information  
 Customer : CDC

Engine : 6 BT-590A

## TEST BENCH REQUIREMENTS

Calibrating oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,3  
 (from BDC) : +0,02(0,04)

Start of delivery block  
 Piston stroke mm: 1,40  
 mm: +0,02(0,06)  
 Outlet : D

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
 Charge press. hPa: 1100

Setting value mm: 1,2...1,6

Supply-pump pressure:

Speed 1/min: 1250  
 Charge press. hPa: 1100  
 Setting value bar: 6,9...7,5

Full-load del. with charge press.:

Speed 1/min: 1100  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 71,5...72,5  
 Dispersion cm<sup>3</sup>/ : 4,6  
 1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 49,5...50,5

Low-idle speed regulation:

Speed 1/min: 375  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 9,0...13,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1360  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 54,0...60,0

Start:

Speed 1/min: 100  
 Charge press. hPa: -  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 55,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100  
 Charge press. hPa: 1100  
 TD travel mm: 0,2...1,0  
 mm: (0,0...1,2)  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1100  
 TD travel mm: 1,2...1,6  
 mm: (0,7...2,1)

### Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 3,6...4,2  
 2nd speed 1/min: 1100  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 6,2...6,8  
 3rd speed 1/min: 1250  
 Charge press. hPa: 1100  
 Supply-pump pressure bar: 6,9...7,5

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: -  
 Overflow quantity cm<sup>3</sup>/10s: 41...83  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1100  
 Overflow quantity cm<sup>3</sup>/10s: 55...138

### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 580  
 LDA stroke mm: 7,5  
 Del.quantity cm<sup>3</sup>/: 65,5...66,5  
 1000H.: (62,5...70,5)  
 2nd speed 1/min: 1550  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 1000H.: -  
 3rd speed 1/min: 1520  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/: 0,0...15,0  
 1000H.: -  
 4th speed 1/min: 1480  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/: 15,0...55,0  
 1000H.: -  
 5th speed 1/min: 1360  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/: 54,0...60,0  
 1000H.: (51,0...63,0)  
 6th speed 1/min: 1250  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/: 70,5...73,5  
 1000H.: (69,0...75,0)  
 7th speed 1/min: 1100  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/: 71,5...72,5  
 1000H.: (69,0...75,0)  
 8th speed 1/min: 750

Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/: 80,0...84,0  
 1000H.: (78,0...86,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 580  
 Del.quantity cm<sup>3</sup>/: 71,5...72,5  
 1000H.: (69,0...75,0)  
 10th speed 1/min: 500  
 Charge press. hPa: 1100  
 Del.quantity cm<sup>3</sup>/: 88,0...96,0  
 1000H.: -  
 11th speed 1/min: 500  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/: 49,5...50,5  
 1000H.: (46,0...54,0)

### Zero delivery (stop):

#### Mech. shutoff:

Speed 1/min: 1250  
 Del.quantity cm<sup>3</sup>/: 0..3  
 1000H.: -

#### Electr. shutoff:

Speed 1/min: 365  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

### Idle delivery:

1st speed 1/min: 375  
 Del.quantity cm<sup>3</sup>/: 9,0...13,0  
 1000H.: (6,0...16,0)  
 2nd speed 1/min: 450  
 Del.quantity cm<sup>3</sup>/: 0,0...4,0  
 1000H.: -

### Automatic starting fuel delivery:

1st speed 1/min: 300  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/: -  
 ind. 1000H: 60,0

2nd speed 1/min: 400  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/: -  
 max. 1000H: 60,0

### Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

### Mounting and assembly dimensions:

Designation

K mm : -  
KF mm : K-OT  
MS mm : 1,0...1,4  
SVS max. mm : 1,5

Remarks:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U24  
 Edition : 16.05.89  
 replaces : -  
 Calibrating oil : ISO 4113  
 Injection pump : VE 6/12F1250 R278  
 Type number : 0 460 426 103

Customer-specific information  
 Customer : CDC

Engine : 6 BT -590A CHRYSLER

### TEST BENCH REQUIREMENTS

Calibrating oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Start of delivery block  
 Piston stroke mm: 1,4  
 mm: +0,02(0,06)  
 Outlet : D

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
 Charge press. hPa: 1200

Setting value mm: 1,3...1,7  
 KSB solenoid-operated  
 valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100  
 Charge press. hPa: 1200  
 Setting value bar: 6,8...7,4  
 KSB solenoid-operated  
 valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 1100  
 Charge press. hPa: 1200  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 75,5...76,5  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 51,5...52,5  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 9,0  
 1000H.: -

Low-idle speed regulation:

Speed 1/min: 350  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 5,5...9,5  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340  
 Charge press. hPa: 1200  
 Del.quantity cm<sup>3</sup>/  
 1000H: 52,5...58,5  
 KSB solenoid-operated  
 valve volt: 12,0

Start:

Speed 1/min: 100  
 Charge press. hPa: -  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 60,0

KSB solenoid-operated  
valve volt: 12,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 450  
Charge press. hPa: -  
TD travel mm: 3,0...4,0  
mm: -

KSB solenoid-operated  
valve volt: -  
2nd speed 1/min: 1000  
Charge press. hPa: 1200  
TD travel mm: 0,5...1,3  
mm: (0,2...1,6)

KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1100  
Charge press. hPa: 1200  
TD travel mm: 1,3...1,7  
mm: (0,8...2,2)

KSB solenoid-operated  
valve volt: 12,0  
4th speed 1/min: 1250  
Charge press. hPa: 1200  
TD travel mm: 2,2...3,0  
mm: (1,9...3,3)

KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 4,1...4,7

KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 1100  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 6,8...7,4

KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1250  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 7,5...8,1

KSB solenoid-operated  
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -

KSB solenoid-operated  
valve volt: 12,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 700  
LDA stroke mm: 6,2  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 68,0...69,0  
1000H.: (64,5...72,5)

2nd speed 1/min: 1550  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0...3,0  
1000H.: -

3rd speed 1/min: 1450  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -

4th speed 1/min: 1410  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -

5th speed 1/min: 1340  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 52,5...58,5  
1000H.: (49,5...61,5)

6th speed 1/min: 1250  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 71,5...74,5  
1000H.: (70,0...76,0)

7th speed 1/min: 1100  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 75,5...76,5  
1000H.: (73,0...79,0)

8th speed 1/min: 750  
Charge press. hPa: 1200

KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 75,0...80,0  
 1000H: (73,0...82,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 700  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 68,0...69,0  
 1000H: (64,5...72,5)  
 10th speed 1/min: 500  
 Charge press. hPa: 1200  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 82,0...94,0  
 1000H: -  
 11th speed 1/min: 500  
 Charge press. hPa: -  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 51,5...52,5  
 1000H: (48,0...56,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
 Del.quantity cm<sup>3</sup>/: 0..3  
 1000H.: -

Electr. shutoff:

Speed 1/min: 350  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 350  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 5,5...9,5  
 1000H.: (2,5...12,5)  
 2nd speed 1/min: 450  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 0,0...4,0  
 1000H.: -  
 3rd speed 1/min: 300  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 8,5...16,5  
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Charge press. hPa: -

KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: -  
 ind. 1000H: 60,0  
 2nd speed 1/min: 250  
 Charge press. hPa: -  
 KSB solenoid-operated valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: -  
 max. 1000H: 50,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	3,7
KF	mm	:	K-OT
MS	mm	:	1,0...1,4
SVS max.	mm	:	1,4
XK	mm	:	18,8...20,8
XL	mm	:	12,5...15,9

Operate control lever after each manifold-pressure compensator pressure change.

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U25  
 Edition : 16.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R278  
 Type number : 0 460 426 103  
 Customer Part-No. : 3 915 289

Customer-specific information  
 Customer : CDC

Engine : 6 BT -590A CHRYSLER

## TEST BENCH REQUIREMENTS

Calibrating oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Start of delivery block  
 Piston stroke mm: 1,4  
 mm: +0,02(0,06)  
 Outlet : D

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100

N09

Charge press. hPa: 1200  
 Setting value mm: 1,3...1,7  
 KSB solenoid-operated  
 valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100  
 Charge press. hPa: 1200  
 Setting value bar: 6,8...7,4  
 KSB solenoid-operated  
 valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 1100  
 Charge press. hPa: 1200  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 73,0...74,0  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 51,0...52,0  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 9,0  
 1000H.: -

Low-idle speed regulation:

Speed 1/min: 350  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 5,5...9,5  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340  
 Charge press. hPa: 1200  
 Del.quantity cm<sup>3</sup>/  
 1000H: 52,5...58,5  
 KSB solenoid-operated  
 valve volt: 12,0

Start:

Speed 1/min: 100  
 Charge press. hPa: -  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 60,0

KSB solenoid-operated  
valve volt: 12,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 450  
Charge press. hPa: -  
TD travel mm: 3,0...4,0  
mm: -

KSB solenoid-operated  
valve volt: -  
2nd speed 1/min: 1000  
Charge press. hPa: 1200  
TD travel mm: 0,5...1,3  
mm: (0,2...1,6)

KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1100  
Charge press. hPa: 1200  
TD travel mm: 1,3...1,7  
mm: (0,8...2,2)

KSB solenoid-operated  
valve volt: 12,0  
4th speed 1/min: 1250  
Charge press. hPa: 1200  
TD travel mm: 2,2...3,0  
mm: (1,9...3,3)

KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 4,1...4,7

KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 1100  
Charge press. hPa: 1200

Supply-pump  
pressure bar: 6,8...7,4

KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1250  
Charge press. hPa: 1200

Supply-pump  
pressure bar: 7,5...8,1

KSB solenoid-operated  
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -

KSB solenoid-operated  
valve volt: 12,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 700  
LDA stroke mm: 6,2  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 68,0...69,0  
1000H.: (64,5...72,5)

2nd speed 1/min: 1550  
Charge press. hPa: 1200

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0...3,0  
1000H.: -

3rd speed 1/min: 1450  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -

4th speed 1/min: 1410  
Charge press. hPa: 1200

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -

5th speed 1/min: 1340  
Charge press. hPa: 1200

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 52,5...58,5  
1000H.: (49,5...61,5)

6th speed 1/min: 1250  
Charge press. hPa: 1200

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 69,0...72,0  
1000H.: (67,5...73,5)

7th speed 1/min: 1100  
Charge press. hPa: 1200

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 73,0...74,0  
1000H.: (70,5...76,5)

8th speed 1/min: 750  
Charge press. hPa: 1200

KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 72,0...77,0  
 1000H: (70,0...79,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 700  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 68,0...69,0  
 1000H: (64,5...72,5)  
 10th speed 1/min: 500  
 Charge press. hPa: 1200  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 79,0...91,0  
 1000H: -  
 11th speed 1/min: 500  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 51,0...52,0  
 1000H: (47,5...55,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
 Del.quantity cm<sup>3</sup>/: 0..3  
 1000H.: -

Electr. shutoff:

Speed 1/min: 350  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 350  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 5,5...9,5  
 1000H.: (2,5...12,5)  
 2nd speed 1/min: 450  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 0,0...4,0  
 1000H.: -  
 3rd speed 1/min: 300  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 8,5...16,5  
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Charge press. hPa: -

KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: -  
 ind. 1000H: 60,0

2nd speed 1/min: 250  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: -  
 max. 1000H: 50,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation	
K	mm : 3,7
KF	mm : K-OT
MS	mm : 1,0...1,4
SVS max.	mm : 1,4
XK	mm : 18,8...20,8
XL	mm : 12,5...15,9

Operate control lever after each  
 manifold-pressure compensator pressure  
 change.

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U33

Edition : 17.05.89

replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R304

Type number : 0 460 426 110

Customer-specific information

Customer : CDC

Engine : 6 BTA

Power k: 136  
Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C

with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : -  
(from BDC) : -

Start of delivery block  
Piston stroke mm: 1,15  
mm: +0,02(0,06)  
Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850  
Charge press. hPa: 1400  
Setting value mm: 2,1...2,5  
KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 850  
Charge press. hPa: 1400  
Setting value bar: 6,1...6,7  
KSB solenoid-operated  
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 1400  
Del.quantity cm<sup>3</sup>/  
1000H.: 82,0...83,0  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup>/ : 4,0  
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 58,5...59,5  
KSB solenoid-operated  
valve volt: 12,0

Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del.quantity cm<sup>3</sup>/  
1000H.: 4,0...6,0  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup>/ : 5,5  
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1370  
Charge press. hPa: 1400  
Del.quantity cm<sup>3</sup>/  
1000H: 61,0...67,0  
KSB solenoid-operated  
valve volt: 12,0

Start:

Speed 1/min: 100  
Charge press. hPa: -  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0

KSB solenoid-operated  
valve volt: 12,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400  
Charge press. hPa: 1400  
TD travel mm: 3,0...4,0  
mm: -

KSB solenoid-operated  
valve volt: -  
2nd speed 1/min: 700  
Charge press. hPa: 1400  
TD travel mm: 0,1...0,9  
mm: (0,0...1,2)

KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 850  
Charge press. hPa: 1400  
TD travel mm: 2,1...2,5  
mm: (1,6...3,0)

KSB solenoid-operated  
valve volt: 12,0  
4th speed 1/min: 1000  
Charge press. hPa: 1400  
TD travel mm: 2,9...3,7  
mm: (2,6...4,0)

KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 4,5...5,1

KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 850  
Charge press. hPa: 1400

Supply-pump  
pressure bar: 6,1...6,7

KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1250  
Charge press. hPa: 1400

Supply-pump  
pressure bar: 7,7...8,3

KSB solenoid-operated  
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -

KSB solenoid-operated  
valve volt: 12,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 850  
LDA stroke mm: 6,6  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 78,0...79,0  
1000H.: (74,0...83,0)

2nd speed 1/min: 1500  
Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -

3rd speed 1/min: 1470  
Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -

4th speed 1/min: 1420  
Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -

5th speed 1/min: 1370  
Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 61,0...67,0  
1000H.: (58,0...70,0)

6th speed 1/min: 1250  
Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 82,0...83,0  
1000H.: (79,5...85,5)

7th speed 1/min: 1100  
Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 80,0...86,0  
1000H.: (78,5...87,5)

8th speed 1/min: 850  
Charge press. hPa: 1400

KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 82,5...89,5  
 1000H.: (81,0...91,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 850  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 78,0...79,0  
 1000H.: (74,0...83,0)  
 10th speed 1/min: 500  
 Charge press. hPa: 1400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 95,5...109,5  
 1000H.: -  
 11th speed 1/min: 500  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 58,5...59,5  
 1000H.: (54,5...63,5)  
  
 Mfg. date: from : 944  
 1st speed 1/min: 700  
 Charge-air pressure-setting  
 point hPa: 745  
 LDA stroke mm: 6,6  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 76,0...77,0  
 1000H.: (72,0...81,0)  
 2nd speed 1/min: 1500  
 Charge press. hPa: 1400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 0,0...3,0  
 1000H.: -  
 3rd speed 1/min: 1470  
 Charge press. hPa: 1400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 0,0...15,0  
 1000H.: -  
 4th speed 1/min: 1420  
 Charge press. hPa: 1400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 15,0...55,0  
 1000H.: -  
 5th speed 1/min: 1370  
 Charge press. hPa: 1400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 61,0...67,0  
 1000H.: (58,0...70,0)  
 6th speed 1/min: 1250  
 Charge press. hPa: 1400  
 KSB solenoid-operated  
 valve volt: 12,0

Del. quantity cm<sup>3</sup>/: 79,0...80,0  
 1000H.: (76,5...82,5)  
 7th speed 1/min: 1100  
 Charge press. hPa: 1400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 77,0...83,0  
 1000H.: (75,5...84,5)  
 8th speed 1/min: 850  
 Charge press. hPa: 1400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 79,5...86,5  
 1000H.: (78,0...88,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 745  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 76,0...77,0  
 1000H.: (72,0...81,0)  
 10th speed 1/min: 500  
 Charge press. hPa: 1400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 92,5...106,5  
 1000H.: -  
 11th speed 1/min: 500  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 58,5...59,5  
 1000H.: (54,5...63,5)  
  
 Zero delivery (stop):  
  
 Mech. shutoff:  
 Speed 1/min: 1250  
 Del. quantity cm<sup>3</sup>/: 0..3  
 1000H.: -  
  
 Electr. shutoff:  
 Speed 1/min: 375  
 ELAB volt: -  
 Del. quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -  
  
 Idle delivery:  
 1st speed 1/min: 375  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 4,0...6,0  
 1000H.: (0,0...10,0)  
 2nd speed 1/min: 400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del. quantity cm<sup>3</sup>/: 0,0...4,0  
 1000H.: -

3rd speed 1/min: 325  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 12,5..20,5  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 80,0

2nd speed 1/min: 240  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,6...3,8  
KF mm : -  
MS mm : 0,8...1,2  
SVS max. mm : 4,4

Operate control lever after each  
manifold-pressure compensator pressure  
change.

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U30  
 Edition : 17.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R304  
 Type number : 0 460 426 110  
 Customer Part-No. : 3 911 239

Customer-specific information  
 Customer : CDC

Engine : 6 BTA

Power k: 136  
 Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Start of delivery block  
 Piston stroke mm: 1,15  
 mm: +0,02(0,06)

Outlet : D

Injection-pump setting values  
 Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 850  
 Charge press. hPa: 1400  
 Setting value mm: 2,1...2,5  
 KSB solenoid-operated  
 valve volt: 24,0

## Supply-pump pressure:

Speed 1/min: 850  
 Charge press. hPa: 1400  
 Setting value bar: 6,1...6,7  
 KSB solenoid-operated  
 valve volt: 24,0

## Full-load del. with charge press.:

Speed 1/min: 1250  
 Charge press. hPa: 1400  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 82,0...83,0  
 KSB solenoid-operated  
 valve volt: 24,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H.: (4,5)

## Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 58,5...59,5  
 KSB solenoid-operated  
 valve volt: 24,0

## Low-idle speed regulation:

Speed 1/min: 375  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 4,0...6,0  
 KSB solenoid-operated  
 valve volt: 24,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

## Full-load speed regulation:

Speed 1/min: 1370  
 Charge press. hPa: 1400  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 61,0...67,0  
 KSB solenoid-operated  
 valve volt: 24,0

## Start:

Speed 1/min: 100  
 Charge press. hPa: -

Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400  
Charge press. hPa: 1400  
TD travel mm: 3,0...4,0  
mm: -

KSB solenoid-operated  
valve volt: -  
2nd speed 1/min: 700  
Charge press. hPa: 1400  
TD travel mm: 0,1...0,9  
mm: (0,0...1,2)

KSB solenoid-operated  
valve volt: 24,0  
3rd speed 1/min: 850  
Charge press. hPa: 1400  
TD travel mm: 2,1...2,5  
mm: (1,6...3,0)

KSB solenoid-operated  
valve volt: 24,0  
4th speed 1/min: 1000  
Charge press. hPa: 1400  
TD travel mm: 2,9...3,7  
mm: (2,6...4,0)

KSB solenoid-operated  
valve volt: 24,0

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 4,5...5,1

KSB solenoid-operated  
valve volt: 24,0  
2nd speed 1/min: 850  
Charge press. hPa: 1400

Supply-pump  
pressure bar: 6,1...6,7  
KSB solenoid-operated  
valve volt: 24,0

3rd speed 1/min: 1250  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 7,7...8,3

KSB solenoid-operated  
valve volt: 24,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -

KSB solenoid-operated  
valve volt: 24,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 24,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 850  
LDA stroke mm: 6,6  
KSB solenoid-operated  
valve volt: 24,0  
Del. quantity cm<sup>3</sup>/: 78,0...79,0  
1000H.: (74,0...83,0)

2nd speed 1/min: 1500

Charge press. hPa: 1400

KSB solenoid-operated

valve volt: 24,0  
Del. quantity cm<sup>3</sup>/: 0,0...3,0

1000H.: -

3rd speed 1/min: 1470

Charge press. hPa: 1400

KSB solenoid-operated

valve volt: 24,0  
Del. quantity cm<sup>3</sup>/: 0,0...15,0

1000H.: -

4th speed 1/min: 1420

Charge press. hPa: 1400

KSB solenoid-operated

valve volt: 24,0  
Del. quantity cm<sup>3</sup>/: 15,0...55,0

1000H.: -

5th speed 1/min: 1370

Charge press. hPa: 1400

KSB solenoid-operated

valve volt: 24,0  
Del. quantity cm<sup>3</sup>/: 61,0...67,0

1000H.: (58,0...70,0)

6th speed 1/min: 1250

Charge press. hPa: 1400

KSB solenoid-operated

valve volt: 24,0  
Del. quantity cm<sup>3</sup>/: 82,0...83,0

1000H.: (79,5...85,5)

7th speed 1/min: 1100

Charge press. hPa: 1400

KSB solenoid-operated

valve volt: 24,0  
Del. quantity cm<sup>3</sup>/: 80,0...86,0

1000H.: (78,5...87,5)

8th speed 1/min: 850

Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 82,5...89,5  
1000H: (81,0...91,0)  
9th speed 1/min: 700  
Charge press. hPa: 850  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 78,0...79,0  
1000H: (74,0...83,0)  
10th speed 1/min: 500  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 95,5...109,5  
1000H: -  
11th speed 1/min: 500  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 58,5...59,5  
1000H: (54,5...63,5)

#### Zero delivery (stop):

#### Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

#### Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

#### Idle delivery:

1st speed 1/min: 375  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 4,0...6,0  
1000H.: (0,0...10,0)  
2nd speed 1/min: 400  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -  
3rd speed 1/min: 325  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 12,5..20,5  
1000H.: -

#### Automatic starting fuel delivery:

1st speed 1/min: 150  
Charge press. hPa: -

KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 80,0  
2nd speed 1/min: 240  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H: 60,0

#### Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

#### Mounting and assembly dimensions:

Designation	mm	:	3,6...3,8
K	mm	:	-
KF	mm	:	0,8...1,2
MS	mm	:	4,4
SVS max.	mm	:	Operate control lever after each manifold-pressure compensator pressure change.

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U32  
 Edition : 17.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R304  
 Type number : 0 460 426 110  
 Customer Part-No. : 3 914 892

Customer-specific information  
 Customer : CDC

Engine : 6 BTA

Power k: 136  
 Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Start of delivery block  
 Piston stroke mm: 1,15  
 mm: +0,02(0,06)  
 Outlet : D

Injection-pump setting values  
 Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 850  
 Charge press. hPa: 1400  
 Setting value mm: 2,1...2,5  
 KSB solenoid-operated  
 valve volt: 12,0

## Supply-pump pressure:

Speed 1/min: 850  
 Charge press. hPa: 1400  
 Setting value bar: 6,1...6,7  
 KSB solenoid-operated  
 valve volt: 12,0

## Full-load del. with charge press.:

Speed 1/min: 1250  
 Charge press. hPa: 1400  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 82,0...83,0  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H.: (4,5)

## Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 58,5...59,5  
 KSB solenoid-operated  
 valve volt: 12,0

## Low-idle speed regulation:

Speed 1/min: 375  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 4,0...6,0  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

## Full-load speed regulation:

Speed 1/min: 1370  
 Charge press. hPa: 1400  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 61,0...67,0  
 KSB solenoid-operated  
 valve volt: 12,0

## Start:

Speed 1/min: 100  
 Charge press. hPa: -

Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0  
KSB solenoid-operated  
valve volt: 12,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400  
Charge press. hPa: 1400  
TD travel mm: 3,0...4,0  
mm: -  
KSB solenoid-operated  
valve volt: -  
2nd speed 1/min: 700  
Charge press. hPa: 1400  
TD travel mm: 0,1...0,9  
mm: (0,0...1,2)  
KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 850  
Charge press. hPa: 1400  
TD travel mm: 2,1...2,5  
mm: (1,6...3,0)  
KSB solenoid-operated  
valve volt: 12,0  
4th speed 1/min: 1000  
Charge press. hPa: 1400  
TD travel mm: 2,9...3,7  
mm: (2,6...4,0)  
KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 4,5...5,1  
KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 850  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 6,1...6,7  
KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1250  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 7,7...8,3  
KSB solenoid-operated  
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500

Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)  
Delivery-quant. and breakaway char.:  
1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 850  
LDA stroke mm: 6,6  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 78,0...79,0  
1000H.: (74,0...83,0)  
2nd speed 1/min: 1500  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
3rd speed 1/min: 1470  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1420  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -  
5th speed 1/min: 1370  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 61,0...67,0  
1000H.: (58,0...70,0)  
6th speed 1/min: 1250  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 82,0...83,0  
1000H.: (79,5...85,5)  
7th speed 1/min: 1100  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 80,0...86,0  
1000H.: (78,5...87,5)  
8th speed 1/min: 850  
Charge press. hPa: 1400

KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 82,5...89,5  
 1000H: (81,0...91,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 850  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 78,0...79,0  
 1000H: (74,0...83,0)  
 10th speed 1/min: 500  
 Charge press. hPa: 1400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 95,5...109,5  
 1000H: -  
 11th speed 1/min: 500  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 58,5...59,5  
 1000H: (54,5...63,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
 Del.quantity cm<sup>3</sup>/: 0,3  
 1000H.: -

Electr. shutoff:

Speed 1/min: 375  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 4,0...6,0  
 1000H.: (0,0...10,0)  
 2nd speed 1/min: 400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 0,0...4,0  
 1000H.: -  
 3rd speed 1/min: 325  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 12,5..20,5  
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150  
 Charge press. hPa: -

KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: -  
 ind. 1000H: 80,0

2nd speed 1/min: 240  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: -  
 max. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation	
K	mm : 3,6...3,8
KF	mm : -
MS	mm : 0,8...1,2
SVS max.	mm : 4,4

Remarks:  
 Operate control lever after each  
 manifold-pressure compensator pressure  
 change.

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U29  
 Edition : 17.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R304  
 Type number : 0 460 426 110  
 Customer Part-No. : 3 914 893

Customer-specific information  
 Customer : CDC

Engine : 6 BTA

Power k: 136  
 Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Start of delivery block  
 Piston stroke mm: 1,15  
 mm: +0,02(0,06)

Outlet : 0

Injection-pump setting values  
 Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 850  
 Charge press. hPa: 1400  
 Setting value mm: 2,1...2,5  
 KSB solenoid-operated  
 valve volt: 24,0

## Supply-pump pressure:

Speed 1/min: 850  
 Charge press. hPa: 1400  
 Setting value bar: 6,1...6,7  
 KSB solenoid-operated  
 valve volt: 24,0

## Full-load del. with charge press.:

Speed 1/min: 1250  
 Charge press. hPa: 1400  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 82,0...83,0  
 KSB solenoid-operated  
 valve volt: 24,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H : (4,5)

## Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 58,5...59,5  
 KSB solenoid-operated  
 valve volt: 24,0

## Low-idle speed regulation:

Speed 1/min: 375  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 4,0...6,0  
 KSB solenoid-operated  
 valve volt: 24,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

## Full-load speed regulation:

Speed 1/min: 1370  
 Charge press. hPa: 1400  
 Del.quantity cm<sup>3</sup>/  
 1000H: 61,0...67,0  
 KSB solenoid-operated  
 valve volt: 24,0

## Start:

Speed 1/min: 100  
 Charge press. hPa: -

Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400  
Charge press. hPa: 1400  
TD travel mm: 3,0...4,0  
mm: -

KSB solenoid-operated  
valve volt: -  
2nd speed 1/min: 700  
Charge press. hPa: 1400  
TD travel mm: 0,1...0,9  
mm: (0,0...1,2)

KSB solenoid-operated  
valve volt: 24,0  
3rd speed 1/min: 850  
Charge press. hPa: 1400  
TD travel mm: 2,1...2,5  
mm: (1,6...3,0)

KSB solenoid-operated  
valve volt: 24,0  
4th speed 1/min: 1000  
Charge press. hPa: 1400  
TD travel mm: 2,9...3,7  
mm: (2,6...4,0)

KSB solenoid-operated  
valve volt: 24,0

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 4,5...5,1

KSB solenoid-operated  
valve volt: 24,0  
2nd speed 1/min: 850  
Charge press. hPa: 1400

Supply-pump  
pressure bar: 6,1...6,7

KSB solenoid-operated  
valve volt: 24,0  
3rd speed 1/min: 1250  
Charge press. hPa: 1400

Supply-pump  
pressure bar: 7,7...8,3

KSB solenoid-operated  
valve volt: 24,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -

KSB solenoid-operated  
valve volt: 24,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 24,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 850  
LDA stroke mm: 6,6  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 78,0...79,0  
1000H.: (74,0...83,0)

2nd speed 1/min: 1500  
Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 0,0...3,0

1000H.: -

3rd speed 1/min: 1470  
Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 0,0...15,0

1000H.: -

4th speed 1/min: 1420  
Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 15,0...55,0

1000H.: -

5th speed 1/min: 1370  
Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 61,0...67,0  
1000H.: (58,0...70,0)

6th speed 1/min: 1250  
Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 82,0...83,0  
1000H.: (79,5...85,5)

7th speed 1/min: 1100  
Charge press. hPa: 1400

KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 80,0...86,0  
1000H.: (78,5...87,5)

8th speed 1/min: 850  
Charge press. hPa: 1400

KSB solenoid-operated valve volt: 24,0  
 Del.quantity cm<sup>3</sup>/: 82,5...89,5  
                   1000H: (81,0...91,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 850  
 KSB solenoid-operated valve volt: 24,0  
 Del.quantity cm<sup>3</sup>/: 78,0...79,0  
                   1000H: (74,0...83,0)  
 10th speed 1/min: 500  
 Charge press. hPa: 1400  
 KSB solenoid-operated valve volt: 24,0  
 Del.quantity cm<sup>3</sup>/: 95,5...109,5  
                   1000H: -  
 11th speed 1/min: 500  
 Charge press. hPa: -  
 KSB solenoid-operated valve volt: 24,0  
 Del.quantity cm<sup>3</sup>/: 58,5...59,5  
                   1000H: (54,5...63,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
 Del.quantity cm<sup>3</sup>/: 0..3  
                   1000H: -

Electr. shutoff:

Speed 1/min: 375  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
                   max. 1000H: -

Idle delivery:

1st speed 1/min: 375  
 KSB solenoid-operated valve volt: 24,0  
 Del.quantity cm<sup>3</sup>/: 4,0...6,0  
                   1000H: (0,0...10,0)  
 2nd speed 1/min: 400  
 KSB solenoid-operated valve volt: 24,0  
 Del.quantity cm<sup>3</sup>/: 0,0...4,0  
                   1000H: -  
 3rd speed 1/min: 325  
 KSB solenoid-operated valve volt: 24,0  
 Del.quantity cm<sup>3</sup>/: 12,5..20,5  
                   1000H: -

Automatic starting fuel delivery:

1st speed 1/min: 150  
 Charge press. hPa: -

KSB solenoid-operated valve volt: 24,0  
 Del.quantity cm<sup>3</sup>/: -  
                   ind. 1000H: 80,0

2nd speed 1/min: 240  
 Charge press. hPa: -  
 KSB solenoid-operated valve volt: 24,0  
 Del.quantity cm<sup>3</sup>/: -  
                   max. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 20,0  
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation  
 K mm : 3,6...3,8  
 KF mm : -  
 MS mm : 0,8...1,2  
 SVS max. mm : 4,4

Operate control lever after each manifold-pressure compensator pressure change.

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U31  
 Edition : 17.05.89  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R304  
 Type number : 0 460 426 110  
 Customer Part-No. : 3 915 290

Customer-specific information  
 Customer : CDC

Engine : 6 BTA

Power k: 136  
 Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : -  
 (from BDC) : -

Start of delivery block  
 Piston stroke mm: 1,15  
 mm: +0,02(0,06)

Outlet : D

Injection-pump setting values  
 Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 850  
 Charge press. hPa: 1400  
 Setting value mm: 2,1...2,5  
 KSB solenoid-operated  
 valve volt: 12,0

## Supply-pump pressure:

Speed 1/min: 850  
 Charge press. hPa: 1400  
 Setting value bar: 6,1...6,7  
 KSB solenoid-operated  
 valve volt: 12,0

## Full-load del. with charge press.:

Speed 1/min: 1250  
 Charge press. hPa: 1400  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 82,0...83,0  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 4,0  
 1000H : (4,5)

## Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 58,5...59,5  
 KSB solenoid-operated  
 valve volt: 12,0

## Low-idle speed regulation:

Speed 1/min: 375  
 Charge press. hPa: -  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 4,0...6,0  
 KSB solenoid-operated  
 valve volt: 12,0  
 Dispersion cm<sup>3</sup>/ : 5,5  
 1000H.: (7,0)

## Full-load speed regulation:

Speed 1/min: 1370  
 Charge press. hPa: 1400  
 Del.quantity cm<sup>3</sup>/  
 1000H: 61,0...67,0  
 KSB solenoid-operated  
 valve volt: 12,0

## Start:

Speed 1/min: 100  
 Charge press. hPa: -

Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0  
KSB solenoid-operated  
valve volt: 12,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400  
Charge press. hPa: 1400  
TD travel mm: 3,0...4,0  
mm: -  
KSB solenoid-operated  
valve volt: -  
2nd speed 1/min: 700  
Charge press. hPa: 1400  
TD travel mm: 0,1...0,9  
mm: (0,0...1,2)  
KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 850  
Charge press. hPa: 1400  
TD travel mm: 2,1...2,5  
mm: (1,6...3,0)  
KSB solenoid-operated  
valve volt: 12,0  
4th speed 1/min: 1000  
Charge press. hPa: 1400  
TD travel mm: 2,9...3,7  
mm: (2,6...4,0)  
KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 4,5...5,1  
KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 850  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 6,1...6,7  
KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1250  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 7,7...8,3  
KSB solenoid-operated  
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500

Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 850  
LDA stroke mm: 6,6  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 78,0...79,0  
1000H.: (74,0...83,0)  
2nd speed 1/min: 1500  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
3rd speed 1/min: 1470  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1420  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -  
5th speed 1/min: 1370  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 61,0...67,0  
1000H.: (58,0...70,0)  
6th speed 1/min: 1250  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 82,0...83,0  
1000H.: (79,5...85,5)  
7th speed 1/min: 1100  
Charge press. hPa: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 80,0...86,0  
1000H.: (78,5...87,5)  
8th speed 1/min: 850  
Charge press. hPa: 1400

KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 82,5...89,5  
 1000H: (81,0...91,0)  
 9th speed 1/min: 700  
 Charge press. hPa: 850  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 78,0...79,0  
 1000H: (74,0...83,0)  
 10th speed 1/min: 500  
 Charge press. hPa: 1400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 95,5...109,5  
 1000H: -  
 11th speed 1/min: 500  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 58,5...59,5  
 1000H: (54,5...63,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
 Del.quantity cm<sup>3</sup>/: 0,3  
 1000H.: -

Electr. shutoff:

Speed 1/min: 375  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 4,0...6,0  
 1000H.: (0,0...10,0)  
 2nd speed 1/min: 400  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 0,0...4,0  
 1000H.: -  
 3rd speed 1/min: 325  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: 12,5..20,5  
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150  
 Charge press. hPa: -

KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: -  
 ind. 1000H: 80,0  
 2nd speed 1/min: 240  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12,0  
 Del.quantity cm<sup>3</sup>/: -  
 max. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation	
K	mm : 3,6...3,8
KF	mm : -
MS	mm : 0,8...1,2
SVS max.	mm : 4,4

Remarks:

Operate control lever after each  
 manifold-pressure compensator pressure  
 change.

Correction at adjusting nut (46)